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TRANSITIONAL PITTING IN TRACHEIDS OF  
PSILOTUM

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Most of the anatomical studies upon *Psilotum* have been in connection with the interpretation of the spore-bearing structures and with the general organization of the stele. Accounts of the anatomical organization of the axis have been largely topographical, discussing the distribution of the cortical tissues and the differentiation of the stelar tissues, principally as seen in cross-section (Bertrand, '85, Boodle, '04, Ford, '04, Stiles, '10). The position and order of development of the wood elements have been very definitely emphasized, whereas the nature of the elements themselves has scarcely been more than mentioned. It has been stated generally that the protoxylem elements are spiral tracheids, and that the metaxylem elements are scalariform or somewhat reticulate tracheids.

Previous anatomical studies have furnished two illustrations of pitting types in the tracheids of *Psilotum*. Bertrand ('85) illustrated diagrammatically several types of tracheids which he had seen in longitudinal section in the stele of the subterranean axis. In the accompanying text he described spiral protoxylem elements and scalariform metaxylem elements with

areolate pits. Boodle ('04) illustrated secondary tracheids having irregular or scalariform pitting.

In other groups of vascular plants, the development of secondary thickening types in the maturation of the primary xylem has been regarded as fundamental recapitulatory evidence of evolution. In *Psilotum*, a simple modern vascular plant that in many respects seems to hark back to the Palaeozoic for its hypothetical ancestors, a knowledge of the type of transitional pitting would be fundamentally important in determining more closely the exact phylogenetic status of the plant.

We have studied material of *Psilotum nudum* (L.) Gris. (*P. triquetrum* Sw.), which was obtained from living plants in the collection of the Missouri Botanical Garden at St. Louis. Pieces of the aerial axis were killed in formalin-acetic-alcohol, embedded in paraffin, and cut into serial longitudinal sections 10  $\mu$  thick with a rotary microtome. The sections were stained with Safranin and Fast Green FCF and photographed on Wratten M plates, using a Wratten G filter with a photoflood light.

The transition in types of secondary thickening of the xylem of *Psilotum*, passing from the protoxylem to the metaxylem, is similar to that described by Bailey ('25) as occurring in various groups of Pteropsids. Due to the small size of the actinostele in *Psilotum*, only a few cells are involved. Consequently the transition is more abrupt than that which is found in more advanced groups. In spite of the fact that only a few cells are involved, there has been observed practically every transition type that has been found in the gymnosperms.

The first formed protoxylem elements invariably are provided with loosely wound spiral or annular secondary thickenings (pl. 17, figs. 1, 7; pl. 18, fig. 9). In the succeeding exarch development of tracheids, the secondary thickening generally forms an irregular reticulate structure (figs. 7, 9). From this stage on, the formation of scalariform pits (fig. 10), of somewhat elongate bordered pits, and of true circular bordered pits is usually observed. The transition seems to follow along a



number of separate lines of specialization which depend in part on the size of the elements involved. The web-like structure may give rise to more or less regular alternately arranged bordered pits (figs. 3, 4, 9), with occasional opposite pits (fig. 4), which are apparently due to irregularities in the net. In smaller cells, or those in which the secondary thickening does not assume the net structure, typical uniseriate bordered pits may be formed (fig. 1). These may be close together (araucarian) or widely spaced (abietinean).

Typical annular or scalariform thickenings (figs. 5, 6, 10) may break up to form circular bordered pits. That we are dealing with true bordered pits seems quite obvious. The overhanging thickenings forming the "dome-like" border of the pits are clearly seen in figs. 8 and 11. We have observed no thickening of the primary wall (torus) in connection with these pits.

It has been conjectured that *Psilotum* may be an extremely ancient plant which has come down through time relatively unchanged morphologically from its psilopsid ancestors, or that *Psilotum* may represent a group of plants once quite complex, but now through reduction become rather simple morphologically (Zimmermann, '30).

The display of transitional pitting seems to us to be of considerable phylogenetic significance. A general type of transition from spiral protoxylem to more definite types of metaxylem pitting has been observed in most large groups of Pteropsida (Bailey, '25). If this uniformity occurred consistently in all groups, such transition would lose significance, but, inasmuch as it is unreported in the Psilophytales, that fact seems to have specific bearing on the relation of *Psilotum* and that group.

Apparently the wood of the Psilophytales showed only annular and spiral thickenings. Kidston and Lang ('20) state definitely that they found no trace of any scalariform or pitted tracheids in the Devonian plants they studied. In *Baragwanathia longifolia*, a vascular plant of Silurian age, only ring-like secondary thickenings have been seen (Lang and Cookson, '35). In other respects the general morphology of *Psilotum* is dis-

tinely not far removed from that of the primitive Devonian plants. It is not difficult to conceive that during the progress of their evolution these Devonian plants gave rise to *Psilotum* with its advanced stelar anatomy, and otherwise morphologically underwent little change.

If *Psilotum* approaches the simple Devonian plants by reason of reduction, one simply infers that the pit transition is vestigial. In the extreme, this line of thought might be considered to show that *Psilotum* represents a phylum of vascular plants, perhaps unrelated to the Psilophytales, in which bordered pits had evolved with or even preceding scalariform types. Then, such a series of transitional stages might be taken to mean that *Psilotum* is a greatly reduced form. Boodle ('04) has suggested that the secondary xylem which he observed in the axis indicated the possibility of origin from the type of *Sphenophyllum* or some Lycopsid.

Unless pitting types, such as we have demonstrated in *Psilotum*, at some future time are found in the simpler Devonian plants, the evidence seems to suggest strongly that *Psilotum* is more highly evolved with respect to these characters than are the Psilophytales.

For the drawings we are indebted to Dr. Gladys E. Baker.

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## EXPLANATION OF PLATE

## PLATE 17

Photomicrographs of types of secondary wall thickening and pitting in xylem of *Psilotum*.

Fig. 1. Elements with loose spiral, spiral thickenings, and bordered pits.

Fig. 2. Elements with annular, reticulate and spiral thickenings.

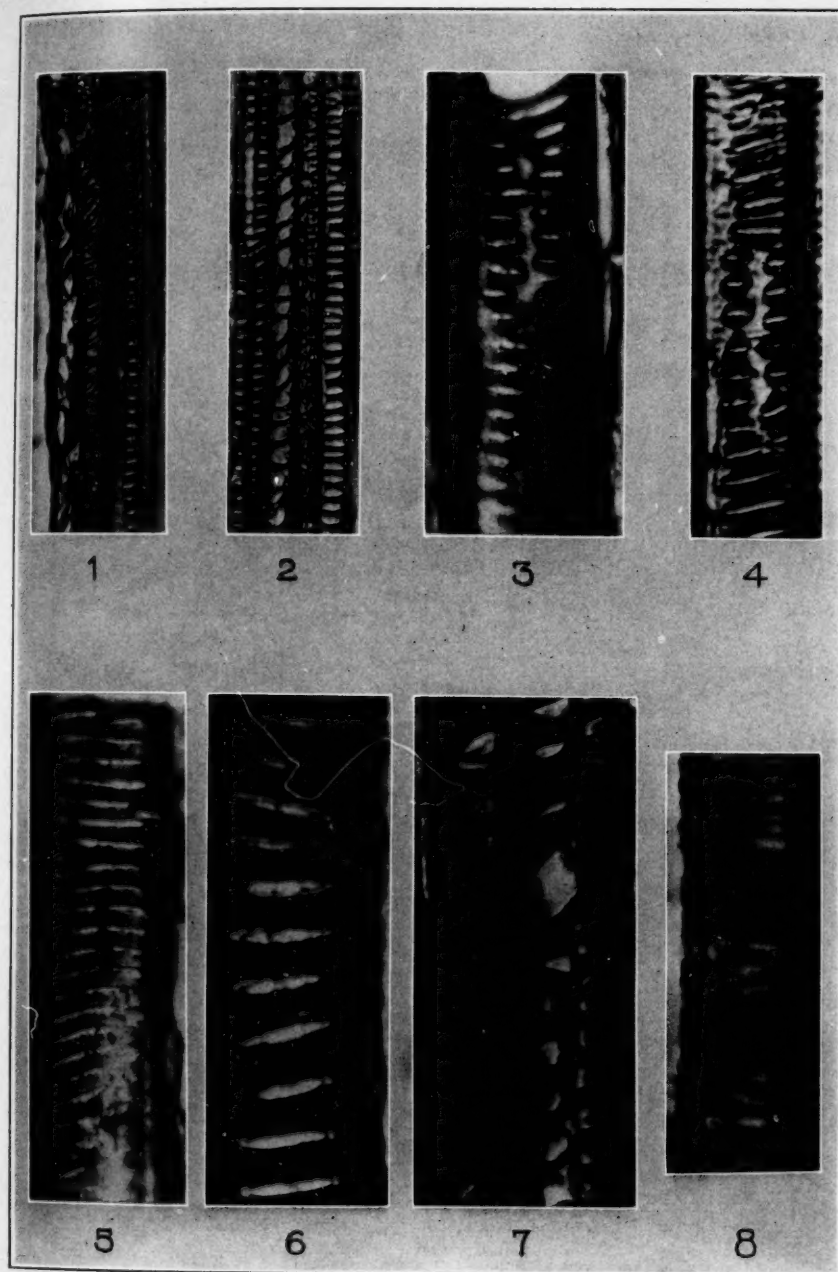
Figs. 3 and 4. Transition from elongate scalariform bordered pits to alternate biseriate bordered pits.

Fig. 5. Typical scalariform metaxylem thickening.

Fig. 6. Elongate bordered pits.

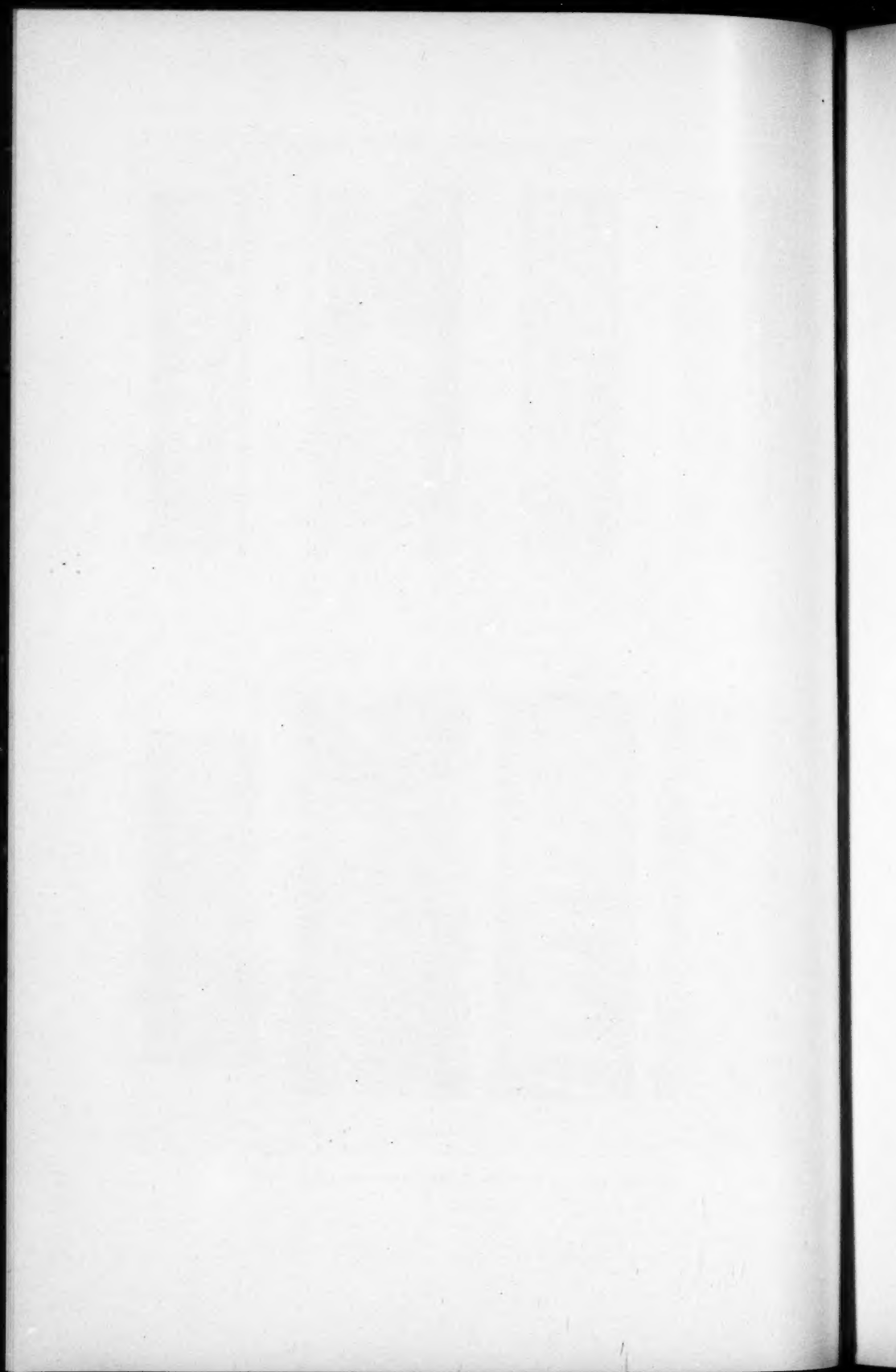
Fig. 7. Spiral thickenings and transition from spiral to reticulate structure.

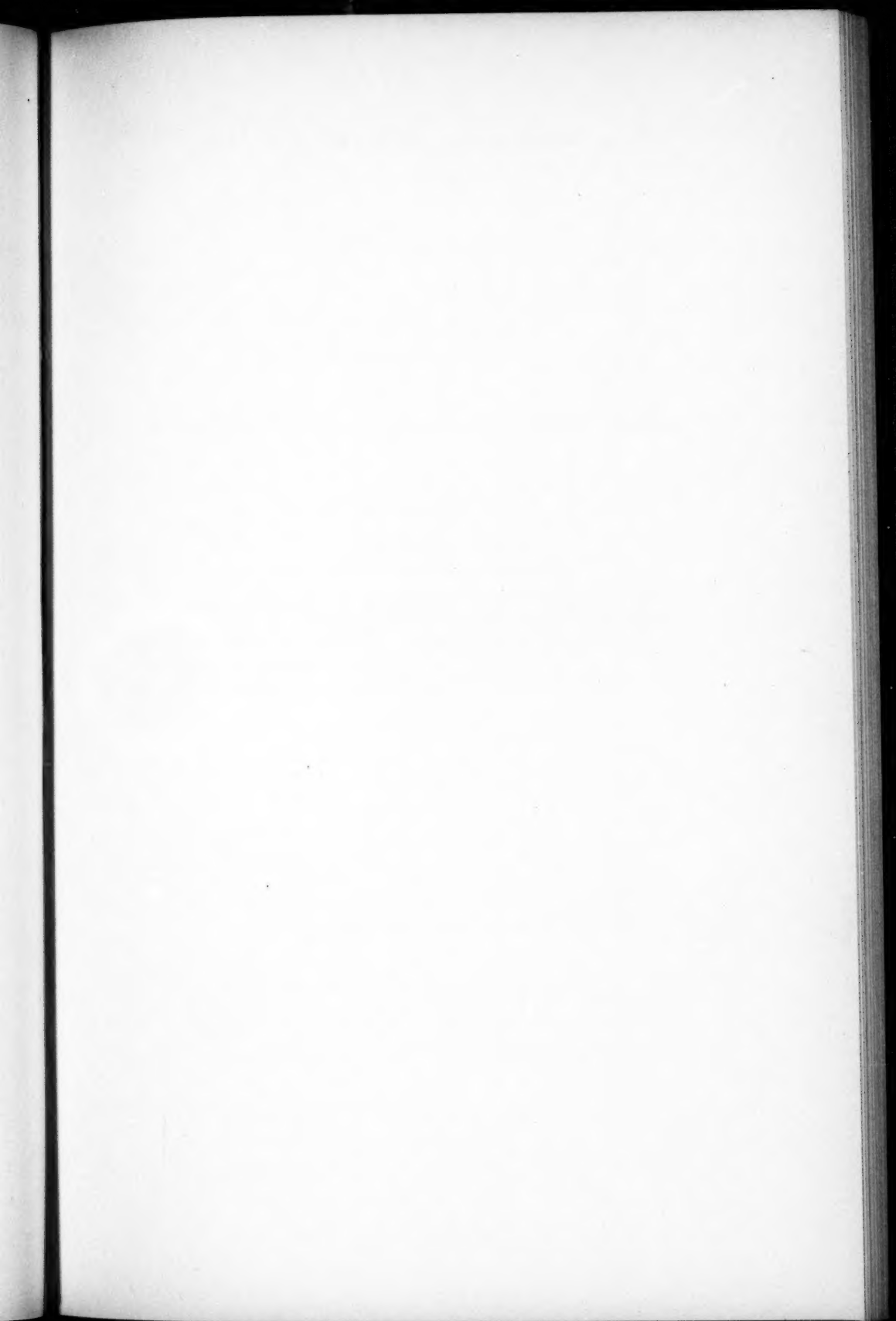
Fig. 8. Section of tracheid wall showing overarching walls of the bordered pit-pairs.



MOORE AND ANDREWS—TRACHEIDS OF PSILOTUM







## EXPLANATION OF PLATE

## PLATE 18

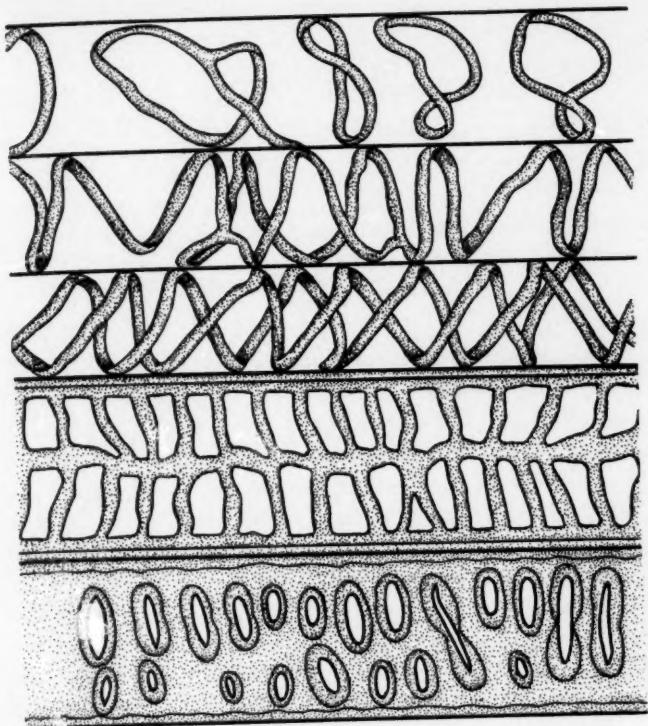
Camera-lucida drawings of tracheids of *Psilotum*.

Fig. 9. Transition stages in development of secondary thickenings from irregular ring-spirals to irregular reticulations to scalariform bordered pits.

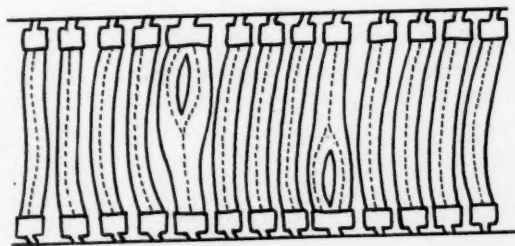
Fig. 10. Scalariform element showing development of occasional bordered pits.

Fig. 11. Structure of bordered pits as seen in longitudinal section.

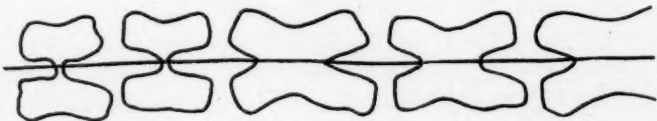
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MOORE AND ANDREWS—TRACHEIDS OF *PSILOTUM*

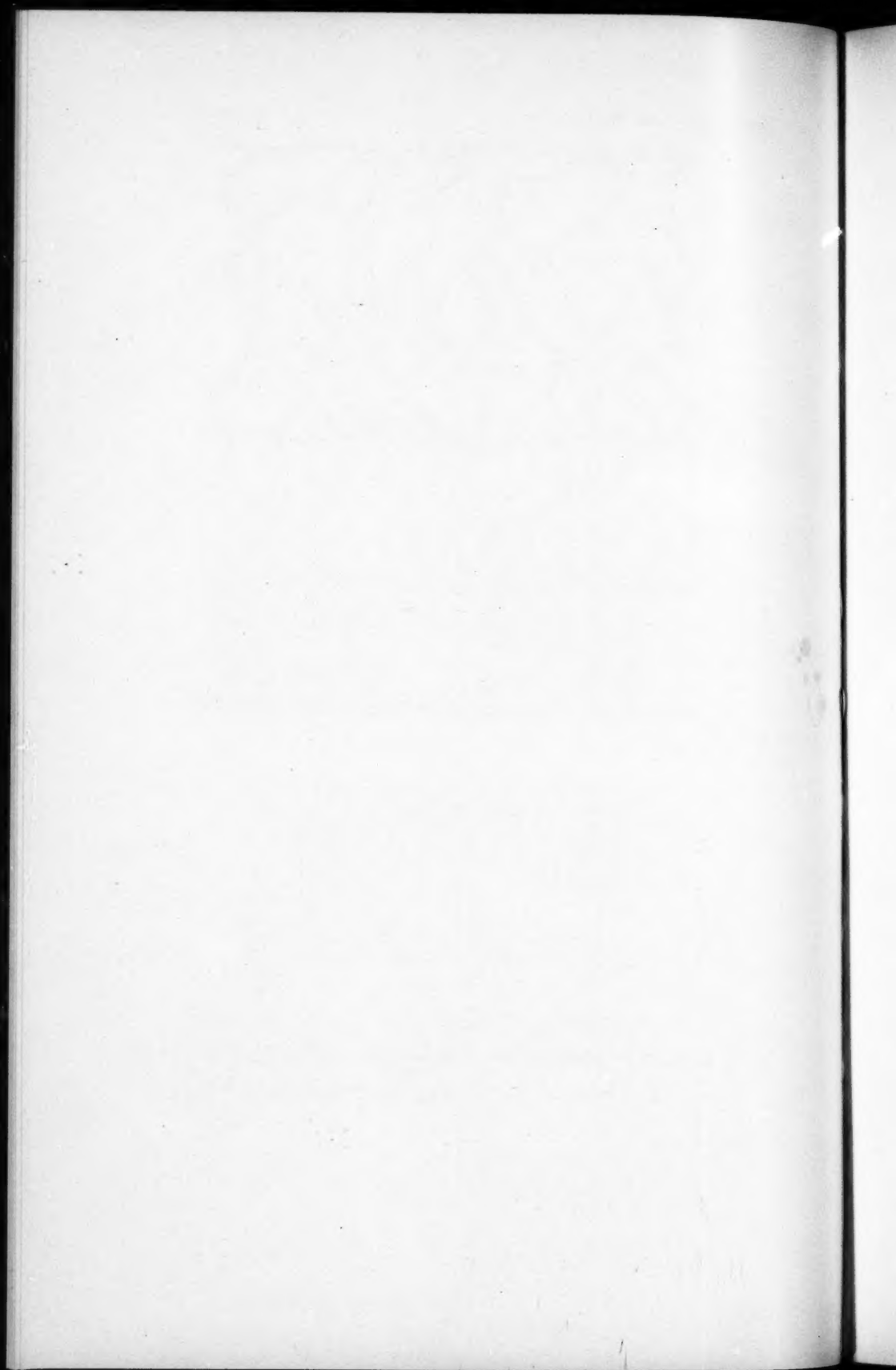


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# AN EXPERIMENTAL STUDY OF HYBRIDIZATION IN THE GENUS APOCYNUM

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## INTRODUCTION

In his monograph of the genus *Apocynum*, Woodson ('30) maintained a rather extreme position as to the prevalence and importance of interspecific hybridization in that genus. He classified the *Apocynums* of eastern North America in four species, *A. hypericifolium*, *A. cannabinum*, *A. androsaemifolium*, and *A. medium*, the last derived from hybridization between two of the others. The remaining variants, largely (according to Woodson) the result of hybridization, were allocated to some 14 varieties of these major species. Figure 2, a copy of his fig. 11, presents a graphical summary of his hypotheses as to phylogenetic relationships in the genus. To the writer these ideas, though stimulating and interesting, seemed rather in need of experimental confirmation by other than purely morphological criteria. After much friendly argument an experiment was planned and carried to completion in the experimental grounds of the Bussey Institution of Harvard University. It consisted in making progeny tests of individual plants of *Apocynum cannabinum* and *A. androsaemifolium*, and their suspected hybrid, *A. medium*. It is pleasant to report that the genetical and cytological data not only confirmed Dr. Woodson's general thesis but that they agreed exactly with several minor details of his hypothesis about which the writer had been extremely skeptical.

*Methods.*—Seed of *Apocynum medium* and *A. cannabinum* was collected by Dr. R. E. Woodson in a field near South Bend, Indiana, where *A. cannabinum* grows in company with a lesser number of *A. androsaemifolium* and their putative hybrid, *A. medium*. Seed was collected from five different plants of *A.*

*medium* and from one plant of *A. cannabinum*, the seeds from each plant being kept separate. The writer collected seeds of *A. androsaemifolium* from one of several plants growing in a meadow on the banks of the Concord River near Billerica, Massachusetts. They were sown in the greenhouse in the winter of 1934 and the resulting seedlings planted out the following spring. During the summer of 1935, when they were a year and a half old and fully mature, they were kept under careful observation by the writer. To reduce the personal equation to a minimum, counts of pollen fertility were made by Mr. Lawrence Regan, who was completely unacquainted with the history of the plants he was examining. The taxonomic determination of the progeny was equally objective. A com-

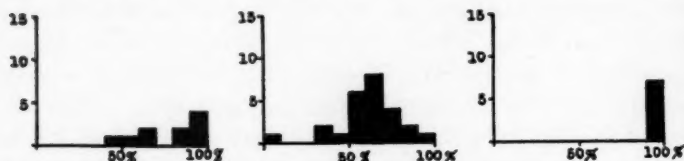


Fig. 1. *A. androsaemifolium* (left), *A. medium* (center), and *A. cannabinum* (right). Horizontal axis represents per cent of fertile pollen, vertical axis, number of individuals.

prehensive flowering and fruiting herbarium specimen was made of nearly every plant. Each was tagged with a serial number, and the specimens, completely shuffled, were handed over to Dr. Woodson for identification. To increase the objectivity he was not even informed as to the source or the specific identity or the relative amount of material grown from seed collected by the writer. The data as presented below are therefore unusually trustworthy, even for a scientific experiment.

The results of the progeny test are presented in full in table 1 and certain points are summarized in fig. 1. The progeny of each plant are listed together; for each seedling the table gives the individual record number, the percentage of fertile pollen as determined by Mr. Regan, and its probable specific identity as determined by Dr. Woodson from the herbarium specimen

submitted to him. His comments have been added in the last column since they have a direct bearing upon the problem.

### CONCLUSIONS

1. *Pollen fertility*.—The progeny of *Apocynum cannabinum* had pollen of uniformly high fertility. Those of *A. androsaemifolium* were mostly of high fertility though a few seedlings were semi-sterile. The progeny of *A. medium* were characterized by a low average fertility. The results are presented graphically in fig. 1.

2. *Genetical results*.—The putative parental species, *A. cannabinum* and *A. androsaemifolium*, both bred true, though both segregated noticeably for presence or absence of pubescence. In spite of the small numbers of seedlings obtained, *A. medium* failed to breed true. Of the twenty-six seedlings of *A. medium* pressed and turned over to Dr. Woodson, eighteen were diagnosed as *A. medium*, six as *A. androsaemifolium*, and two as *A. cannabinum*. It is also significant that all the plants about whose absolute specific identity Dr. Woodson had some doubt were among these seedlings of *A. medium*. The comments in the right-hand column of table 1 give a very true picture of the comparative variability of the progeny of *A. cannabinum* and *A. androsaemifolium*, on the one hand, and of *A. medium*, on the other.

3. *Apocynum medium*.—This species is therefore most certainly a hybrid and might well be designated as such in botanical literature. In addition to the evidence which originally led Woodson ('30) to that conclusion, the above experiment has demonstrated that, like most hybrids, it produces variable progeny of low average fertility. Some of these progeny resemble the putative parental species so strongly that in the absence of any information as to their source, they would unhesitatingly be so identified by any one familiar with the species in question.

4. *Apocynum cannabinum* and *A. androsaemifolium*.—These are probably more or less self-sterile as Woodson had already suspected ('30). The existence of as much variation as was

TABLE I  
RESULTS OF PROGENY TESTS OF ONE PLANT OF *APOCYNUM CAN-*  
*NABINUM*, ONE OF *A. ANDROSAEMIFOLIUM*, AND FIVE OF *A. MEDIUM*  
(Further explanation in the text)

|   | Seed-<br>ling<br>No. | Per<br>cent<br>fertile<br>pollen | Identification                                  | Remarks   |
|---|----------------------|----------------------------------|---|---|
| <i>A. cannabinum</i><br>No. 447—South Bend,<br>Ind.       | 1                    | 95                               | <i>A. cannabinum</i> var.<br><i>typicum</i>     |   |
|   | 2                    | 93                               | <i>A. cannabinum</i> var.<br><i>typicum</i>     |   |
|   | 3                    | 91                               | <i>A. cannabinum</i> var.<br><i>glaberrimum</i> |   |
|   | 4                    | 98                               | <i>A. cannabinum</i> var.<br><i>glaberrimum</i> |   |
|   | 5                    | 98                               | <i>A. cannabinum</i> var.<br><i>typicum</i>     |   |
|   | 6                    | 97                               | <i>A. cannabinum</i> var.<br><i>typicum</i>     |   |
|   | 7                    | 94                               | <i>A. cannabinum</i> var.<br><i>glaberrimum</i> |   |
| <i>A. androsaemifolium</i><br>No. 503—Billerica,<br>Mass. | 1                    | 60                               |   | Specimen lost                                       |
|   | 2                    | 89                               | <i>A. androsaemifolium</i>                      | Very typical  |
|   | 3                    | 42                               | <i>A. androsaemifolium</i>                      |   |
|   | 4                    | 99                               | <i>A. androsaemifolium</i>                      | Fairly typical                                      |
|   | 5                    | 86                               | <i>A. androsaemifolium</i>                      |   |
|   | 6                    | 96                               | <i>A. androsaemifolium</i>                      | Essentially typical                                 |
|   | 7                    | 95                               | <i>A. androsaemifolium</i>                      | Very typical  |
|   | 8                    | 95                               | <i>A. androsaemifolium</i>                      | Typical   |
|   | 9                    | 95                               |   | Specimen lost                                       |
|   | 10                   | 64                               | <i>A. androsaemifolium</i>                      |   |
|   | 11                   | 68                               |   | Specimen lost                                       |
| <i>A. medium</i><br>No. 446—South Bend,<br>Ind.           | 1                    | 89                               | <i>A. medium</i>                                | Glabrous leaves                                     |
|   | 2                    | 63                               | <i>A. medium?</i>                               | Like a small <i>A. an-</i><br><i>drosaemifolium</i> |
|   | 3                    | 57                               | <i>A. medium</i>                                | Glabrous  |
|   | 4                    | 64                               | <i>A. medium</i>                                | Close to var.<br><i>leuconeuron</i>                 |
|   | 5                    | 68                               | <i>A. medium</i>                                | Sparsely pubescent                                  |
|   | 6                    | 64                               | <i>A. medium</i>                                | Sparsely pubescent                                  |
|   | 7                    | 39                               | <i>A. medium</i>                                | Glabrous  |
|   | 8                    | 72                               | <i>A. medium</i>                                | Glabrous  |
|   | 9                    | 55                               | <i>A. medium</i>                                | Glabrous  |
|   | 10                   | 63                               | <i>A. medium?</i>                               | Unusually small<br>flowers                          |
|   | 11                   | 99                               | <i>A. cannabinum</i> var.<br><i>glaberrimum</i> |   |
| No. 448—South Bend,<br>Ind.                               | 1                    | 61                               | Probably a glabrous<br><i>A. medium</i>         |   |
|   | 2                    | 77                               | <i>A. medium</i>                                |   |

TABLE I—(Continued)

RESULTS OF PROGENY TESTS OF ONE PLANT OF *APOCYNUM CANNABINUM*, ONE OF *A. ANDROSAEMIFOLIUM*, AND FIVE OF *A. MEDIUM*  
(Further explanation in the text)

|   | Seed-<br>ling<br>No. | Per<br>cent<br>fertile<br>pollen | Identification                                    | Remarks                   |
|---|----------------------|----------------------------------|---|---------------------------|
| <i>A. medium</i> (Cont.)<br>No. 449—South Bend,<br>Ind. | 1                    | 77                               | <i>A. medium</i>                                  | But very small<br>flowers |
|   | 2                    | 53                               | <i>A. medium</i>                                  | Quite typical             |
|   | 3                    | 78                               | <i>A. medium</i>                                  | But nearly glabrous       |
|   | 4                    | 93                               | <i>A. androsaemifolium</i>                        |                           |
|   | 5                    | 98                               | <i>A. medium</i>                                  |                           |
| No. 502—South Bend,<br>Ind.                             | 1                    | 90                               | <i>A. cannabinum</i> var.<br><i>glaberrimum</i> ? |                           |
|   | 2                    | 65                               | <i>A. androsaemifolium</i>                        | But small-flowered        |
| No. 504—South Bend,<br>Ind.                             | 1                    | 58                               | <i>A. medium</i> ?                                |                           |
|   | 2                    | 37                               | <i>A. androsaemifolium</i> ?                      | Possibly a hybrid         |
|   | 3                    | 41                               | <i>A. medium</i>                                  |                           |
|   | 4                    | 4                                | <i>A. androsaemifolium</i>                        |                           |
|   | 5                    | 57                               | <i>A. androsaemifolium</i> ?                      | Corolla rather small      |

exhibited between sister plants of either species indicates that intra-specific cross-pollinations must be frequent (Anderson, '28). G. Medwedewa has recently shown ('35) for *Apocynum venetum* that pollen-tubes may reach the ovary after self-pollination. She explains the lack of seed obtained in experimental selfings as due to the fact that flowers isolated in paper bags were inundated by their own nectar. There are, however, other mechanisms for self-sterility beside differential pollen-tube growth as has been shown by Stout and Chandler ('33) and others. Medwedewa's demonstration of the superior accelerating effect of foreign stigmas as compared to those from the same plant may be an indication of a deep-seated incompatibility which allows pollen-tube growth in the style but either prevents fertilization or the development of self-fertilized zygotes. As Medwedewa has suggested (loc. cit.), precise genetical tests of vicinism are really necessary for a decisive answer. The results reported above, particularly the progeny test of a plant of *A. androsaemifolium* from Billerica,



bear directly on this point. This plant was not growing in the vicinity of other species of *Apocynum* nor was there any indication of hybridity in the colony, and yet there was marked variation between its progeny. This would indicate a high percentage of out-crossing.

#### DISCUSSION

No one doubts any longer that inter-specific hybridization can take place in nature. There remain the determination of its comparative frequency, its taxonomic importance, and its phylogenetic consequences. The evidence reported above suggests that hybridization is of fairly frequent occurrence in the genus, and that it is largely responsible for the taxonomic difficulties encountered in classifying the species of *Apocynum* in eastern North America. These difficulties spring not from the main bulk of the genus, which is readily segregated into the chief species, but from a small percentage of puzzling aberrants. *Apocynum medium* in itself constitutes no great problem in classification, whether it be accepted as a hybrid or maintained as a species. It is rather the small percentage of specimens which are *almost* like typical *A. androsaemifolium*, or *almost* like *A. cannabinum*, or near *A. medium*, which provides a very real problem in classification. Should one deal with these variants as separate species, as was done by the late Edward L. Greene; should one ignore them more or less completely, as have many American botanists; or should one catalogue them as varieties of *A. cannabinum*, *A. androsaemifolium*, and *A. medium*, as was done by Woodson in his monograph? Cogent objections can be raised and have been raised to each of the above procedures. The experiments reported above give little or no information as to the best means of dealing with these puzzling variants; that is of course mainly a problem in classification. On the biological question of their origin and phylogenetic importance the evidence is, however, quite specific. Clearly, if the above results are typical, these variants are secondary hybrids one or more generations removed from the original cross between the species. They may

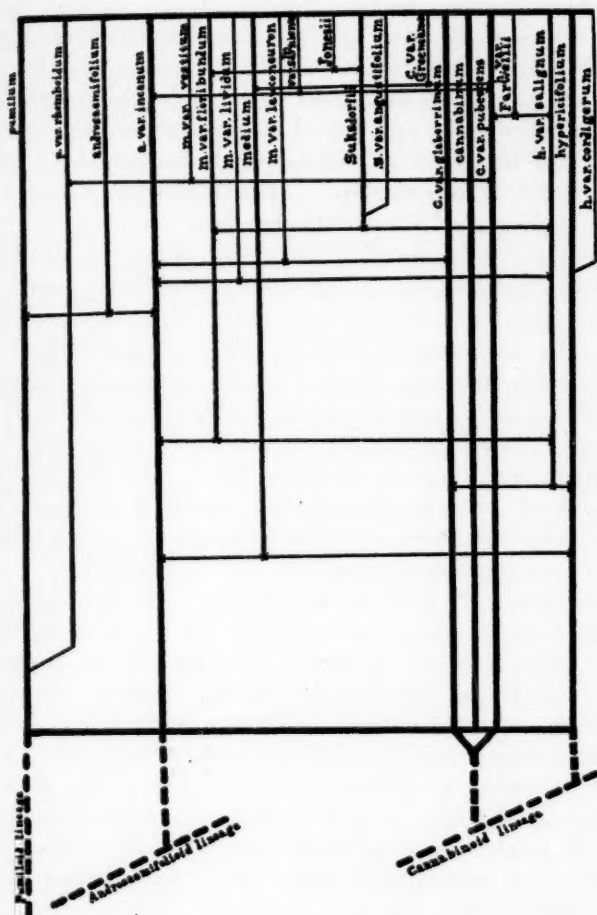


Fig. 2. Phylogenetic relationships of American species of *Apocynum* according to Woodson. Broken lines represent the hypothetical rudiments of the genus, the solid lines, the supposed relationship of the known species and varieties.

Note: According to more recent nomenclatural corrections, "*A. androsaemifolium*" in the chart should read *A. androsaemifolium* var. *glabrum*; and "*A. androsaemifolium* var. *incanum*" should be *A. androsaemifolium*, typical variety (cf. *Rhodora* 34: 30-31. 1932).

be very probably crossed back to one of original parental species, at least in part, and may often resemble that species superficially. It will be remembered that the puzzling seedlings of *A. androsaemifolium* came not directly from that species, but were hybrid segregates closely resembling it. In *Apocynum*, therefore, one of the chief effects of hybridization seems to be the enrichment of the variability of the original species taking part in the hybridization.

The actual creation of a new intermediate species by that process, while certainly a possibility, does not seem to have been effected in the case of *A. medium*. That binomial may be a necessity for purposes of classification, but biologically it is still in a far different status from *A. androsaemifolium* and *A. cannabinum*. To reach that status it would require a period of isolation and the operation of natural selection to remove the variability and the semi-sterility which now characterize it. The behavior of *A. medium* No. 449 and of *A. medium* No. 446 is particularly interesting. The former must apparently have been a first-generation cross, for like such plants it is highly heterozygous. Its progeny (pl. 19, fig. 3) include everything from almost straight *A. cannabinum* to a superficially normal *A. androsaemifolium*. *Apocynum medium* No. 446, on the other hand, bred almost true (pl. 19, fig. 4). Most of its progeny were more or less like itself; in it the *A. medium* type is on the way to becoming stabilized and it probably represents a hybrid of the second generation or later. Given a fair degree of isolation there seems to be no reason why such an intermediate type might not in a comparatively short time reach a specific status comparable to that of *A. cannabinum* or of *A. androsaemifolium*.

#### SUMMARY

1. Progeny tests were made of *Apocynum androsaemifolium*, *A. cannabinum*, and their putative hybrid, *A. medium*.
2. *Apocynum androsaemifolium* and *A. cannabinum* bred true. *A. medium* produced a variable set of seedlings, some of them indistinguishable from *A. androsaemifolium* and *A. cannabinum*.

3. The seedlings of *A. cannabinum* had uniformly high percentages of fertile pollen and those of *A. androsaemifolium* were nearly as fertile. Those of *A. medium* were of low average fertility.

4. It is concluded that *A. medium* is certainly a hybrid.

5. The taxonomic importance and phylogenetic consequences of interspecific hybridization in *Apocynum* are discussed in the light of these results. It is suggested that the chief effect of hybridization in this genus in eastern North America at the present time is to increase variability in the parental species.

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## EXPLANATION OF PLATE

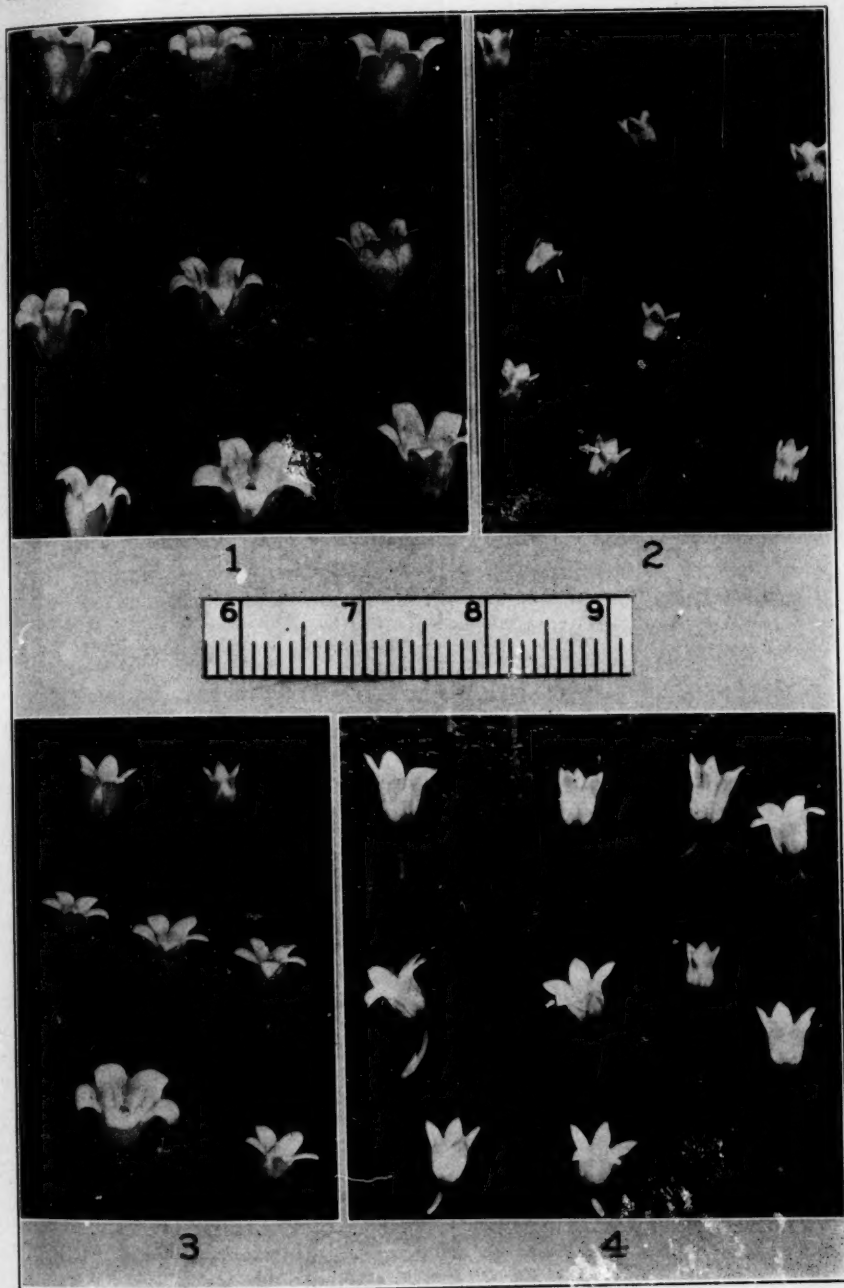
## PLATE 19

Photographs of one flower from each plant for;

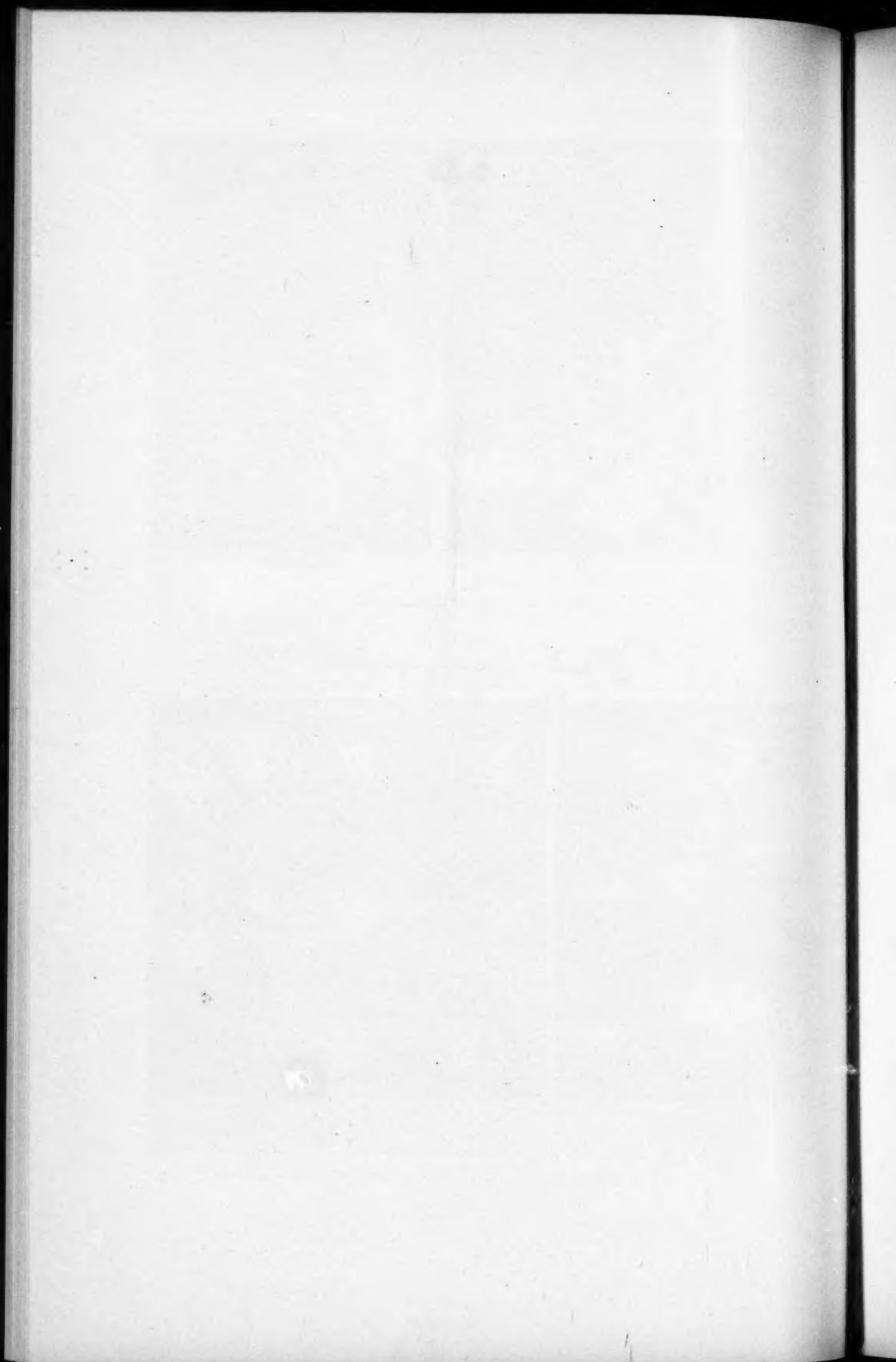
- 1, nine seedlings of *A. androsaemifolium* No. 503.
- 2, eight seedlings of *A. cannabinum* No. 447.
- 3, seven seedlings of *A. medium* No. 449.
- 4, ten seedlings of *A. medium* No. 446.

In the center a portion of a centimeter scale photographed at the same magnification for comparison.





ANDERSON—HYBRIDIZATION IN APOCYNUM



## STUDIES IN THE APOCYNACEAE. IV<sup>1</sup>

### THE AMERICAN GENERA OF ECHITOIDEAE

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### X. NEOBRACEA Britton

**Neobracea** Britton, in Britton & Millsp. Bahama Fl. 335. 1920; Urb. Symb. Ant. 9: 240. 1924.

**Bracea** Britton, Bull. N. Y. Bot. Gard. 3: 448. 1905, not King.

Lactescent shrubs or small trees. Stems erect to ascending, terete; branches dichotomous to alternate when adventitious. Leaves opposite, shortly petiolate, penninerved, eglandular, the petioles subtended by 2-several inconspicuous stipular appendages. Inflorescence terminal, less frequently to subterminal or lateral, scorpioidally corymbose to subumbellate, few- to several-flowered, inconspicuously bracteate. Calyx 5-parted, the lobes equal or subequal, cleft nearly to the receptacle, imbricated, eglandular, or bearing within 5-10 alternate squamellae. Corolla infundibuliform, the tube straight, inappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel sporangia borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective; pollen granular. Carpels 2, united at the apex by a common stylar shaft surmounted by the capitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate, or somewhat crescent at the base. Follicles 2, apocarpous, terete, acuminate, dehiscent along the ventral suture, containing many dry, truncate, apically comose seeds.

<sup>1</sup> Concluded from ANN. MO. BOT. GARD. 22: 153-306. (187)-(340). 1935.

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(169)

Type species: *Neobracea bahamensis* Britton, in Britton & Millsp. Bahama Fl. 335. 1920.

#### KEY TO THE SPECIES

- a. Plants glabrous throughout; calyx-lobes rather conspicuously foliaceous, ovate to ovate-oblong; plants of Cuba.....1. *N. Valenzuelana*
- aa. Plants more or less conspicuously pubescent throughout; calyx-lobes scarious or only slightly foliaceous, ovate- to oblong-trigonal.
  - b. Inflorescence corymbose, the peduncle equalling or surpassing the pedicels; plants of Cuba.....2. *N. angustifolia*
  - bb. Inflorescence umbellate or subumbellate, the peduncle markedly shorter than the pedicels.
    - c. Squamellae evident; follicles 15-25 cm. long; plants of the Bahama Islands.....3. *N. bahamensis*
    - cc. Squamellae obsolete or extremely inevident; follicles 5-7 cm. long; plants of Cuba.....4. *N. Ekmanii*

#### 1. *Neobracea Valenzuelana* (A. Rich.) Urb. Symb. Ant. 9: 241. 1924.

*Echites Valenzuelana* A. Rich. in Sagra, Hist. Cuba 11: 93. 1850.

*Rhabdadenia Wrightiana* Muell.-Arg. Linnaea 30: 438. 1860.

*Mandevilla Wrightiana* (Muell.-Arg.) Benth. & Hook. Gen. Pl. 2: 727. 1876.

*Angadenia Valenzuelana* (A. Rich.) Miers, Apoc. So. Am. 181. 1878.

Stems relatively stout, glabrous; leaves opposite, shortly petiolate, obovate to oblong-oblancheolate, apex rounded and usually minutely emarginate, base narrowly cuneate, 2.5-6.0 cm. long, 0.8-2.0 cm. broad, coriaceous, glabrous throughout, dark green, nitidulous above, paler, opaque beneath; petioles 0.5-0.7 cm. long; inflorescence terminal, occasionally pseudolateral, subumbellate, bearing 1-5 pale rose flowers; peduncle 0.2-0.8 cm. long; pedicels 2.0-2.5 cm. long, glabrous; bracts 0.2-0.3 cm. long; calyx-lobes ovate to ovate-oblong, obtuse to broadly acute, 0.3-0.5 cm. long, rather conspicuously foliaceous, glabrous, the squamellae in alternate groups of 3-4; corolla infundibuliform, glabrous without, the proper-tube 0.4-0.5 cm. long, about 0.15 cm. in diameter at the base, the

throat broadly conical, 0.8–0.9 cm. long, about 0.6–0.65 cm. in diameter at the orifice, the lobes obliquely obovate-dolabriform, obtuse, 1.4–1.5 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers narrowly sagittate, 0.4–0.425 cm. long, minutely tomentulose dorsally; ovary ovoid, about 0.1 cm. long, glabrous; stigma capitate, 0.1 cm. long; nectaries about half equalling the ovary, more or less conspicuously 3-lobed; follicles relatively slender and flexile, very obscurely articulated, 11–15 cm. long, glabrous; seeds 0.7–0.8 cm. long, the very pale, yellowish coma 1.1–1.3 cm. long.

CUBA: ORIENTE: prope Paso Estancia ad Pinales versus in collibus calcareis, May, 1880, *Wright 399* (B, G, MBG, NY, US, V); swampish thicket, alt. 400–500 m., Sierra Nipe, along trail Piedra Gorda to Woodfred, Dec. 8, 1909, *Shafer 3106* (NY); Tiguaillos, Baracoa, Sept. 2, 1917, *Boig 109* (NY); Camp La Gloria, south of Sierra Moa, Dec. 24–30, 1910, *Shafer 8268* (NY); by water, barren savannas, southeast of Holguin, April 9, 1909, *Shafer 1281* (NY); SANTA CLARA: edge of arroyo, palm barren, Santa Clara, April 8–9, 1912, *Britton & Cowell 13290* (NY); palm barren, Motembo, Aug. 10, 1918, *Leon & Roca 8237* (NY); MATANZAS: serpentine hills, near Cauasi, Oct. 10, 1927, *Leon 13127* (NY); bushy savanna, San Miguel de los Baños, Aug. 8, 1919, *Leon & Roca 8904* (NY); HABANA: eruptive rock soil, Madruga, March 31, 1903, *Shafer 13* (NY); Baños del Boticario, not far from Campo Florido, July 18, 1912, *Leon 3353* (NY); PINAR DEL RIO: San Jose de Sagua to San Marcos, on serpentine rocks, Jan. 27, 1912, *Shafer 11966* (NY).

The habit of this species varies from that of a shrub to that of a small tree, the height of plants being reported as from 1 to 8 meters. The corolla is white to pinkish, reddish-flushed in the throat. The calyx-lobes, although not large, are rather conspicuously foliaceous, consisting of a definite lamina, in which the midrib is prominent. The spreading position of the calyx-lobes is characteristic.

2. *Neobraces angustifolia* Britton, Bull. Torrey Bot. Club 53: 462. 1926.

Stems relatively stout, softly hirsutulose when young, eventually becoming glabrate and inconspicuously lenticellate; leaves opposite, shortly pedicellate, narrowly oblong-elliptic, apex acute to obtuse, base rather narrowly cuneate, 5–7 cm. long, 0.7–1.3 cm. broad, firmly membranaceous, the margins somewhat revolute in desiccation, either surface softly and

rather densely puberulent; petioles 0.3–0.5 cm. long, puberulent; inflorescence lateral, alternate, somewhat shorter than the subtending leaves, bearing 8–20 small, purplish (?) flowers; peduncle minutely puberulent; pedicels 0.45–0.5 cm. long, minutely puberulent; calyx-lobes rather narrowly trigonal, acute to acuminate, 0.2–0.25 cm. long, minutely puberulent without, the solitary, alternate squamellae extremely minute; corolla infundibuliform, minutely and rather sparsely puberulent without, the proper-tube 0.3–0.35 cm. long, about 0.125 cm. in diameter at the base, the throat conical-campanulate, 0.35 cm. long, about 0.4–0.425 cm. in diameter at the orifice, the lobes oblong-dolabriform, obtuse, 0.7–0.725 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers rather narrowly sagittate, 0.325 cm. long, minutely tomentulose dorsally; ovary oblong-ovoid, about 0.1 cm. long, glabrous; stigma subcapitate, about 0.075 cm. long; nectaries compressed-ovoid, about one-third equalling the ovary; follicles unknown.

CUBA: PINAR DEL RIO: rocky soil between Santa Cruz and Las Cayuelas, April 12, 1924, *Boig 3227* (NY, TYPE, MBG, photograph and analytical drawings).

**3. *Neobracea bahamensis*** Britton, in Britton & Millsp. *Bahama Fl.* 335. 1920.

*Bracea bahamensis* Britton, *Bull. N. Y. Bot. Gard.* 3: 448. 1905.

Stems relatively stout, minutely puberulent when young, eventually becoming glabrate; leaves opposite, shortly petiolate, broadly elliptic to oblong-ob lanceolate, apex obtuse to rounded, base more or less narrowly cuneate, 1.5–10.0 cm. long, 0.5–2.5 cm. broad, coriaceous, above yellowish-green, somewhat nitidulous, essentially glabrous, beneath paler, densely and minutely puberulent; petioles 0.2–0.6 cm. long, minutely puberulent; inflorescence terminal, less frequently to subterminal or lateral, umbellate, bearing 1–10 white, reddish-flushed flowers; peduncle 0.4–1.6 cm. long, minutely puberulent; pedicels 0.7–1.5 cm. long, minutely puberulent; bracts very minute, 0.1 cm. or less in length; calyx-lobes trigonal, 0.2–0.3 cm. long, minutely



puberulent without, the squamellae obsolete or extremely inevident; corolla infundibuliform, minutely puberulent without, the proper-tube 0.15–0.17 cm. long, about 0.1 cm. in diameter at the base, the throat rather narrowly conical, 0.5–0.8 cm. long, about 0.3–0.35 cm. in diameter at the orifice, the lobes obliquely obovate, 1.5–1.8 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers narrowly sagittate, 0.35 cm. long, minutely puberulent dorsally; ovary ovoid, about 0.1 cm. long, glabrous; stigma subcapitate, 0.1–0.125 cm. long; nectaries somewhat shorter than the ovary, dentiform; follicles relatively slender and flexile, obscurely and distantly moniliform, 15–25 cm. long, glabrous; seeds 0.45–0.5 cm. long, the pale yellowish coma 1.4–1.5 cm. long.

BAHAMA ISLANDS: New Providence, June 7, 1879, *Brace 493* (NY, TYPE); near Nassau, N. P., April and May, 1903, *Curtiss 137* (MBG, NY); borders of salt marsh, Millers, N. P., Sept. 3, 1904, *Britton & Brace 526* (NY); border of mangrove swamp, Deep Creek, Andros, Aug. 18–Sept. 10, 1906, *Brace 5177* (NY); pineland, near Fresh Creek, Andros, Jan. 28–31, 1910, *Small & Carter 8751* (NY); rocky plain, Orange Creek and vicinity, Cat Island, Febr. 27–28, 1907, *Britton & Millspaugh 5783* (NY); Landrail Point, Crooked Island, Jan. 9–23, 1906, *Brace 4670* (NY); coastal coppice, Pinder's Point, Great Bahama, Febr. 5–13, 1905, *Britton & Millspaugh 2511* (NY); road to South Side, Long Cay, Dec. 7–17, 1905, *Brace 4053* (NY); scrubland, near Georgetown, Great Exuma, Febr. 22–28, 1905, *Britton & Millspaugh 2970* (NY).

#### 4. *Neobracea Ekmanii* Urb. Symb. Ant. 9: 242. 1924.

Stems relatively stout, essentially glabrous; leaves opposite, shortly petiolate, elliptic to elliptic-oblong, apex acute to very obsoletely acuminate, occasionally obtuse, base cuneate, 1–2 cm. long, 0.4–0.8 cm. broad, coriaceous, above essentially glabrous, more or less nitidulous, beneath opaque, minutely and rather sparsely pilosulose; petioles 0.3–0.5 cm. long, very minutely pilosulose; inflorescence terminal, 1-flowered; peduncle 0.3–0.4 cm. long, essentially glabrous; pedicel 0.2–0.3 cm. long, very minutely pilosulose; calyx-lobes linear-trigonal, obtusish, about 0.25 cm. long, minutely pilosulose, eglandular within; corolla, anthers, and ovary unknown; follicles terete, relatively stout, 5–7 cm. long, essentially glabrous without; seeds 0.5–0.6 cm. long, the pale tawny coma about 1.8 cm. long.

CUBA: ORIENTE: prope Maravi, in pinetis, *Ekman 4051* (B, TYPE).



I have not been able to examine the type specimen, hence the preceding description is merely an adaptation of Urban's.

#### XI. GALACTOPHORA Woodson

**Galactophora** Woodson, Ann. Mo. Bot. Gard. 19: 49. 1932.

Lactescent, suffruticose undershrubs or suffrutescent herbs. Branches erect or ascending, opposite to occasionally alternate above. Leaves opposite, coriaceous to subcoriaceous, petiolate to subsessile, entire, penninerved, eglandular; petioles somewhat girdling at the node into an obscurely appendiculate, stipular ring. Inflorescence terminal to subterminal, scorpioidally corymbose to subumbellate, bracteate, relatively few-flowered. Calyx 5-parted, the lobes equal to subequal, cleft nearly to the receptacle, imbricated, foliaceous, bearing within several to many indefinitely distributed squamellae. Corolla infundibuliform, large and showy, the proper-tube straight, inappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel sporangia with a conspicuous protuberant base borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective; pollen granular. Carpels 2, united at the apex by a common stylar shaft surmounted by the 5-gonal, fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, coalescent, and usually somewhat adnate to the ovary. Follicles 2, apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, truncate, apically comose seeds.

Type species: *Galactophora crassifolia* (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 19: 50. 1932.

#### KEY TO THE SPECIES

- a. Inflorescence 5-10-flowered, corymbose; calyx-lobes linear-lanceolate....  
.....I. *G. pulchella*
- aa. Inflorescence 1-5-flowered, subumbellate; calyx-lobes broadly ovate to ovate-lanceolate.
- b. Calyx and corolla puberulent, bearing irregularly interspersed, glandular aculei.

- c. Calyx-lobes 1.5–2.0 cm. long; leaves broadly oblong to oblong-lanceolate.....2. *G. crassifolia*  
 cc. Calyx-lobes 0.5–0.6 cm. long; leaves ovate.....3. *G. Schomburgkiana*  
 bb. Calyx and corolla glabrous.  
 c. Corolla-tube 3–4 cm. long, the lobes about 1.5 cm. long; leaves broadly oblong.....4. *G. calycina*  
 cc. Corolla-tube 5.0–5.5 cm. long, the lobes about 4.5 cm. long; leaves broadly ovate.....5. *G. magnifica*

**1. *Galactophora pulchella* Woodson, Ann. Mo. Bot. Gard. 19:**

51. 1932.

Stems relatively stout, softly puberulent when young, soon becoming glabrate; leaves opposite, subsessile and somewhat amplexicaul, broadly ovate, apex obtusish, base abruptly rounded and obscurely cordate, 3.5–7.0 cm. long, 2.5–4.5 cm. broad, glabrous, or either surface softly puberulent when young; petioles 0.1–0.2 cm. long; inflorescence corymbose, 5–10-flowered; peduncle 3–5 cm. long, softly puberulent; pedicels 1.0–1.5 cm. long, softly puberulent with small, glandular aculei interspersed rather irregularly; bracts inconspicuous; calyx-lobes linear-lanceolate, 0.5–0.75 cm. long, minutely puberulent with interspersed aculei; corolla infundibuliform essentially glabrous without, or with extremely inconspicuous indument and aculei, the proper-tube 0.5–0.6 cm. long, about 0.2 cm. in diameter at the base, the throat 1.5 cm. long, about 0.4 cm. in diameter at the orifice, the lobes obliquely oblong-obovate, obtuse, 1.0–1.25 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers lanceolate-sagittate, 0.5–0.6 cm. long, glabrous; ovary oblong-ovoid, about 0.15 cm. long, glabrous; stigma about 0.15 cm. long; nectaries somewhat shorter than the ovary; follicles unknown.

BRAZIL: AMAZONAS. [?]: Cano Pimicheiro, June, 1854, *Spruce 3718* (K, TYPE, MBG, photograph and analytical drawings).

**2. *Galactophora crassifolia* (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 19: 50. 1932.**

*Amblyanthera crassifolia* Muell.-Arg. in Mart. Fl. Bras.

6<sup>1</sup>: 143. 1860.

*Echites crassifolia* Spruce, ex Muell.-Arg. loc. cit. 1860, nom. nud. in synon.

*Rhodocalyx crassifolius* (Muell.-Arg.) Miers, Apoc. So. Am. 139. 1878.

*Mandevilla crassifolia* Muell.-Arg. ex K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895, sphalm.

*Mandevilla crassifolia* (Spruce) K. Sch. ex Mgf. in Fedde, Rep. Spec. Nov. 20: 24. 1924, sphalm.

Stems relatively stout, minutely puberulent with interspersed, glandular aculei when young, becoming glabrate; leaves opposite, subsessile, broadly oblong to oblong-lanceolate, apex obtuse to rounded, base rather abruptly rounded and obscurely cordate, more or less amplexicaul, 5–12 cm. long, 3–5 cm. broad, coriaceous, glabrous; petioles 0.1–0.2 cm. long, glabrous to aculeate as upon the stem; inflorescence subumbellate, 1–5-flowered; pedicels 1.2–1.5 cm. long, glabrous to minutely puberulent; bracts scarious, about 0.1 cm. long; calyx-lobes ovate, acute, 1.5–2.0 cm. long, more or less conspicuously aculeate; corolla infundibuliform, conspicuously aculeolate without, the proper-tube 2.5–3.0 cm. long, about 0.2 cm. in diameter at the base, the throat 3 cm. long, about 2 cm. in diameter at the orifice, the lobes obliquely obovate, obtuse, 2.5–3.0 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers lanceolate-sagittate, 0.6–0.7 cm. long, glabrous, or infrequently sparsely barbellate at the base of the narrow auricles; ovary oblong-ovoid, about 0.3 cm. long, glabrous; stigma 0.15 cm. long; nectaries about half equalling the ovary; follicles relatively stout, rigid, 12–16 cm. long, glabrous; seeds 0.3 cm. long, the tawny coma about 2 cm. long.

VENEZUELA: AMAZONAS: Cerro Yapacana, upper Rio Orinoco, alt. 100 m., April, 1931, *Holt & Blake 716* (US).

BRITISH GUIANA: exact locality lacking, Dec., 1842, *Schomburgk 1551* (B).

BRAZIL: AMAZONAS: prope San Carlos, ad Rio Negro, 1853–4, *Spruce 3136* (B, Camb., K, V, MBG, photograph and analytical drawings); in campis arenosis prope Faro, date lacking, *Ducke 8434* (B); Manáos, July 31, 1900, *Ule 5175* (B); MATTO GROSSO: Juruena Provedencia, April, 1909, *Hoeber 1804* (B); Cataqui-Imain, Jan., 1919, *Kuhlmann 2252* (B).

**3. *Galactophora Schomburgkiana*** Woodson, Ann. Mo. Bot. Gard. 19: 50. 1932.

Stems relatively stout, softly puberulent when young, soon

becoming glabrate; leaves opposite, subsessile, broadly ovate, apex obtusish, base abruptly rounded, obscurely cordate and more or less amplexicaul, 4–7 cm. long, 2.5–4.5 cm. broad, coriaceous, softly puberulent when young, soon becoming glabrate; petioles 0.1–0.2 cm. long; inflorescence subumbellate, 3–5-flowered; pedicels 1.0–1.5 cm. long, softly puberulent with interspersed aculei; bracts extremely inconspicuous; calyx-lobes ovate, acutish, 0.5–0.6 cm. long, minutely puberulent, evidently rarely aculeolate; corolla infundibuliform, aculeate-striate without, the proper-tube 2–3 cm. long, about 0.2 cm. in diameter at the base, the throat 3.0–3.5 cm. long, about 0.8 cm. in diameter at the orifice, the lobes obliquely obovate, obtuse, 1.0–1.2 cm. long; stamens inserted at the base of the corolla-throat, the anthers and gynoecium unseen; follicles relatively stout, 14 cm. long, densely aculeolate; seeds 0.6 cm. long, the tawny coma 1.5–2.0 cm. long.

BRITISH GUIANA: exact locality and date lacking, *Schomburgk s. n.* (K, TYPE, MBG, photograph and analytical drawings).

**4. *Galactophora calycina* (Hub.) Woodson**, *Ann. Mo. Bot. Gard.* 19: 50. 1932.

*Dipladenia calycina* Hub. ex Ducke, *Archiv. Jard. Bot. Rio Janeiro* 3: 247. 1922; *Bol. Mus. Goeldi* 7: 113. 1913, nom. nud.

#### *Plate 2.*

Stems relatively stout, glabrous; leaves opposite, subsessile, broadly oblong, apex obtuse or rounded, frequently somewhat retuse, base rather abruptly rounded, obscurely cordate and more or less amplexicaul, 3–6 cm. long, 2–4 cm. broad, coriaceous, glabrous; petioles about 0.1 cm. long; inflorescence subumbellate, 1–5-flowered; pedicels 0.5–0.7 cm. long, glabrous; bracts very inconspicuous; calyx-lobes ovate, acute, 1.5–2.0 cm. long, glabrous; corolla infundibuliform, glabrous without, the proper-tube 1.5–2.0 cm. long, about 0.2 cm. in diameter at the base, the throat 1.5–2.0 cm. long, about 1 cm. in diameter at the orifice, the lobes broadly obovate, obtuse, 1.2–1.6 cm. long,

widely spreading; stamens inserted at the base of the corolla-throat, the anthers narrowly sagittate, 0.6–0.7 cm. long, glabrous; ovary ovoid, about 0.4 cm. long, glabrous; stigma 0.2 cm. long; nectaries somewhat less than half equalling the ovary; follicles unknown.

BRAZIL: PARA: Faro, inter fruticulos loco Campos do Tigre, Dec. 31, 1919, *Ducke 11393* (B, S. MBG, photograph and analytical drawings); Cachoeira, sandy ground of new clearing, 1898, *Gwynne-Vaughan 33* (K, MBG, photograph and analytical drawings).

**5. *Galactophora magnifica* Woodson, Ann. Mo. Bot. Gard. 19: 382. 1932.**

Stems relatively stout, glabrous; leaves opposite, sessile, broadly ovate, apex obtuse, base broadly cordate and amplexicaul, 4.5–5.0 cm. long, 3.0–3.5 cm. broad, coriaceous, wholly glabrous; inflorescence subumbellate, few- (in our specimen 3-) flowered; pedicels 0.9–1.0 cm. long, glabrous; bracts extremely minute, scarious; calyx-lobes broadly ovate-lanceolate, acuminate, 2.0–2.5 cm. long, glabrous; corolla glabrous without, the proper-tube 2.0–2.3 cm. long, about 0.4 cm. in diameter at the base, the throat broadly campanulate, 2.8–3.0 cm. long, about 2.5 cm. in diameter, the lobes obliquely ovate, shortly acuminate, 4.5 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers narrowly sagittate, 0.8 cm. long, glabrous; ovary oblongoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries somewhat shorter than the ovary; follicles unknown.

BRAZIL: MATTO GROSSO: Proecedencia Juruena, campo humido e pantuoso, April, 1909, *Hochne 1759* (US, TYPE, MBG, photograph and analytical drawings).

**XII. SALPINCTES Woodson**

***Salpinctes* Woodson, in Gleason, Bull. Torrey Bot. Club 58: 453. 1931.**

Lactescent, suffrutescent herbs or suffruticose undershrubs. Stems erect to ascending, terete. Leaves opposite to subverticillate, shortly petiolate to essentially sessile, penninerved, eglandular. Inflorescence terminal, uniflorous in our



specimens. Calyx 5-parted, the lobes equal to subequal, cleft nearly to the receptacle, imbricated, bearing many indefinitely distributed squamellae within. Corolla salverform, the tube straight, exappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel sporangia borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective; pollen granular, Carpels 2, united at the apex by an elongate, common style surmounted by the pentagonal-fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 2, separate. Follicles apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, truncate, apically comose seeds.

Type species: *Salpinctes kalmiaefolius* Woodson, in Gleason, Bull. Torrey Bot. Club 58: 453. 1931.

#### KEY TO THE SPECIES

- a. Leaves oblong-ovate, 0.8–1.0 cm. broad, strictly opposite; stems glabrous .....1. *S. kalmiaefolius*
- aa. Leaves oblong-linear, 0.2–0.4 cm. broad, opposite to subverticillate; stems scabrous-bullate .....2. *S. duidae*

1. *Salpinctes kalmiaefolius* Woodson, in Gleason, Bull. Torrey Bot. Club 58: 453. *pl.* 37. 1931.

#### Plate 3.

Stems relatively stout, 2–5 dm. tall (fide Tate), wholly glabrous; leaves opposite, subsessile, oblong-ovate, apex obtuse to rounded, base rounded to subtruncate, 2–4 cm. long, 0.8–1.0 cm. broad, heavily coriaceous, the margin strongly revolute in desiccation, wholly glabrous, lustrous above, opaque beneath; petioles 0.1–0.15 cm. long; inflorescence terminal, bearing a solitary, showy, bright pink flower; peduncle essentially obsolete; pedicels 0.15–0.2 cm. long, glabrous; bracts broadly triangular-ovate, about 0.1 cm. long, scarious, caducous; calyx-lobes ovate-lanceolate, acuminate, 0.45–0.5 cm. long, scarious, glabrous; corolla salverform, glabrous without, the tube 2.5–3.5

cm. long, about 0.125 cm. in diameter at the base, slightly dilating toward the orifice, the lobes obliquely obovate, obtuse, 2.5–3.0 cm. long, widely spreading; stamens inserted somewhat below midway within the corolla-tube, the anthers narrowly sagittate, 0.45 cm. long, glabrous; ovary ovoid, about 0.125 cm. long, glabrous; stigma 0.15 cm. long; nectaries 2, somewhat shorter than the ovary; follicles unknown.

BRITISH GUIANA: dryish slopes of Savanna Hills, alt. 4400 ft., Aug., 1928–April, 1929, *Tate 836* (NY, TYPE, MBG, photograph and analytical drawings).

**2. *Salpinctes* (?) *duidae*** Woodson, in Gleason, Bull. Torrey Bot. Club 58: 454. 1931.

Stems relatively stout, 1.5–3.0 dm. tall, scabrous-bullate; leaves crowded, opposite to subverticillate, essentially sessile, oblong-linear, 3–6 cm. long, 0.2–0.4 cm. broad, heavily coriaceous, the margins strongly revolute, glabrous and lustrous above, opaque and slightly scabridulous to glabrate beneath; inflorescence evidently uniflorous, but the flowers unknown at present; follicles relatively stout, essentially continuous, 10–12 cm. long, glabrous; seeds unknown.

BRITISH GUIANA: dry ridge tops, Savanna Hills, alt. 4400 ft., Aug., 1928–April, 1929, *Tate 805* (NY, TYPE, MBG, photograph).

This genus is no better understood than when first published, due to the lack of additional specimens or other data concerning it. At the time of original publication the genus *Dipladenia* A. DC. was considered to be distinct from *Mandevilla* Lindl. upon the basis of the geminate nectaries of the former. Since the discovery of manifest intergradation between these genera and their subsequent consolidation, the status of *Salpinctes*, also based in part upon geminate nectaries, has been somewhat uneasy. The situation of *Salpinctes* is not exactly parallel, however, because of its relatively few species, also characteristic of its immediate relatives. Hence, the probability of intergradation is somewhat less imminent than amongst the numerous and wide-ranging species of *Mandevilla* and *Dipladenia*. Should a *Galactophora* be found with salverform corollas, and a *Salpinctes* with five conerescent nectaries, however,



the existing criteria separating those genera would become too attenuated for practicality.

### XIII. PELTASTES Woodson

**Peltastes** Woodson, Ann. Mo. Bot. Gard. 19: 375. 1932.

Lactescent, fruticose or suffruticose lianas. Branches opposite, or the uppermost alternate. Leaves opposite, petiolate, peltate, entire, penninerved, eglandular, firmly membranaceous to subcoriaceous; petioles somewhat girdling at the node into an obscurely appendiculate, stipular ring. Inflorescence lateral, opposite, infrequently terminal or subterminal, aggregate-dichasial, bracteate, few- to several-flowered. Calyx 5-parted, the lobes subequal to more or less conspicuously dissimilar, cleft nearly to the receptacle, imbricated, strikingly foliaceous, bearing within at the base many indefinitely distributed squamellae. Corolla infundibuliform, large and showy, the proper-tube straight, exappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute; stamens 5, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel sporangia with a conspicuous protuberant base borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective; pollen granular. Carpels 2, united at the apex by a slender stylar shaft surmounted by the capitate-fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, essentially separate. Follcles 2, apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, rostrate, apically comose seeds.

Type species: *Peltastes peltatus* (Vell.) Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932.

#### KEY TO THE SPECIES

- a. Anthers glabrous.
  - b. Calyx-lobes 1.0–1.5 cm. long; corolla-lobes broadly and obliquely obovate, obtuse, 2.5–3.0 cm. long; plants of southeastern Brazil. .1. *P. malvaeflorus*
  - bb. Calyx-lobes 1.5–2.0 cm. long; corolla-lobes dolabriform, acute to acuminate, 2.0–2.5 cm. long; plants of Paraguay. . . . . 2. *P. stemmadeniiflorus*
- aa. Anthers pubescent dorsally.

- b. Corolla-throat broadly conical to campanulate, at least above.
- c. Corolla 4.0-5.5 cm. long; species of South America.
- d. Calyx-lobes obovate to broadly obovate-oblong; corolla proper-tube 2.2-2.5 cm. long; plants of Colombia and Venezuela...3. *P. colombianus*
- dd. Calyx-lobes narrowly oblong to oblong-elliptic; corolla proper-tube 0.9-1.0 cm. long; plants of southeastern Brazil.....4. *P. peltatus*
- ee. Corolla 7.8-8.3 cm. long; plants of Panama and Costa Rica...5. *P. isthmicus*
- bb. Corolla-throat narrowly conical to subtubular-conical; plants of Bolivia.....6. *P. giganteus*

1. *Peltastes malvaeiflorus* Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932.

*Plate 4.*

Stems relatively stout, densely ferruginous-lanulose when young, eventually becoming glabrate; leaves opposite, broadly ovate, rather shortly acuminate at the apex, base broadly rounded, 10-16 cm. long, 7-11 cm. broad, firmly membranaceous, above minutely and rather sparsely ferruginous-puberulent when young, eventually becoming glabrate, beneath minutely and persistently ferruginous-puberulent; petioles 2-4 cm. long, densely and persistently ferruginous-lanulose; inflorescences lateral, opposite, 3-5-flowered, the peduncle about equalling the length of the subtending petioles, densely ferruginous-lanulose; pedicels 2.3-2.5 cm. long, ferruginous-lanulose; bracts foliaceous, obovate to obovate-lanceolate, 0.5-2.0 cm. long; calyx-lobes oblong to oblong-lanceolate, acute to obtuse, 1.0-1.5 cm. long, minutely and rather inconspicuously ferruginous-puberulent without; corolla infundibuliform, glabrous without, the proper-tube 1.0-1.2 cm. long, about 0.6 cm. in diameter at the base, the throat broadly conical-campanulate, dilating almost directly above the insertion of the stamens, 2.0-2.3 cm. long, 2.3-2.5 cm. in diameter at the orifice, the lobes broadly and obliquely obovate, obtuse, 2.5-3.0 cm. long, slightly spreading; anthers 1.1-1.3 cm. long, glabrous; ovary about 0.2 cm. long, essentially glabrous; nectaries fleshy, essentially equal, about equalling the ovary; stigma 0.3 cm. long; follicles relatively stout, 20-25 cm. long, the tips more or less persistently connate, glabrous or very minutely papillate; seeds 2.3 cm. long, the pale orange coma about 5 cm. long.

BRAZIL: PARANA: Valhinos ad marginem silvae primaevae, Nov. 11, 1910, *Dusen* 10851 (G, MBG, TYPE, S, US); Roca Noya, ad marginem silvae, March 15, 1909, *Dusen*, 7884 (S); Ponta Grossa, in silvula, Jan. 15, 1909, *Dusen* 7552 (NY, S); RIO GRANDE DO SUL: Silveira Martina, prope Santa Maria, in silva primaeva, March 6, 1893, *Malme* 690 (S, COTYPE, MBG, photograph); prope São Leopoldo, Febr., year lacking, *Dutra* 301 (S).

**2. *Peltastes stemmadeniiflorus* Woodson, Ann. Mo. Bot. Gard. 19: 377. 1932.**

Stems relatively stout, densely ferruginous-lanulose when young, eventually becoming glabrate; leaves opposite, broadly ovate, apex very shortly acute to acuminate, base broadly rounded, 10–30 cm. long, 7–15 cm. broad, minutely and rather sparsely ferruginous-puberulent when young, eventually becoming glabrate upon both surfaces; petioles 3–7 cm. long, minutely ferruginous-lanulose when young, eventually becoming glabrate; inflorescences lateral, opposite, 8–10-flowered, the peduncle somewhat shorter than the subtending petioles, minutely ferruginous-hirtellous; pedicels 1.0–1.5 cm. long, minutely ferruginous-hirtellous; bracts foliaceous, obovate-lanceolate, 0.4–1.2 cm. long; calyx-lobes oblong- to elliptic-lanceolate, acute to acuminate, 1.5–2.0 cm. long, minutely ferruginous-puberulent without; corolla infundibuliform, glabrous without, the proper-tube 1.3–1.4 cm. long, about 0.4 cm. in diameter at the base, the throat broadly conical to campanulate, dilating almost directly above the insertion of the stamens, 3.0–3.2 cm. long, 1.2–1.3 cm. in diameter at the orifice, the lobes broadly dolabriform, acute to acuminate, 2.0–2.5 cm. long, slightly spreading; anthers 1.2–1.3 cm. long, glabrous; ovary about 0.25 cm. long, essentially glabrous; nectaries fleshy, essentially equal, about equalling the ovary; stigma 0.25 cm. long; follicles unknown.

PARAGUAY: in altiplanitie et declivibus, Sierra de Amambay, Dec., 1907, *Rojas* 9838 (V, TYPE, MBG, photograph and analytical drawings); in woods, Mbuena, Febr., 1931, *Jørgensen* 4711 (MBG, NY); in reg. fluminis Alto Parana, 1909–10, *Fiebrig* 5841 (G, US).

The distinction of *P. malvaeflorus* and *P. stemmadeniiflorus* may well be questioned. The plants are of much the same general aspect, although it is believed that the rather slight di-

mensional differences are significant. The corolla-lobes also appear to invite specific segregation. The corolla-throat of the latter species is much narrower than that of the former; and such differences, when taken into consideration with the supposedly distinct, if adjacent, ranges of the species have prompted their separate maintenance, at least until more ample, contradictory evidence is forthcoming.

**3. *Peltastes colombianus* Woodson, Ann. Mo. Bot. Gard. 19: 378. 1932.**

Stems relatively stout, densely ferruginous-lanulose when young, eventually becoming glabrate; leaves opposite, broadly ovate, very shortly subcaudate-acuminate, base broadly rounded to subtruncate, 16–28 cm. long, 10–22 cm. broad, above very minutely puberulent when young, soon becoming glabrate, beneath persistently puberulent-papillate; petioles 5–11 cm. long, minutely ferruginous-puberulent to glabrate; inflorescences 7–15-flowered, the peduncle densely and persistently ferruginous-lanulose; pedicels 1.5–2.0 cm. long, minutely ferruginous-lanulose; bracts foliaceous, obovate to obovate-oblong, 1.0–1.6 cm. long; calyx-lobes obovate to obovate-elliptic, acute to obtuse, 2.3–3.0 cm. long, obtuse to very shortly acuminate, very minutely and inconspicuously puberulent without; corolla infundibuliform, glabrous without, the proper-tube 2.2–2.5 cm. long, about 0.4 cm. in diameter at the base, the throat not directly dilated above the insertion of the stamens, differentiated into a more or less distinct upper- and lower-throat, the former 1.0–1.3 cm. long, scarcely broader than the proper-tube, the latter abruptly dilated, campanulate, 0.8–1.0 cm. long, about 1.2–1.5 cm. in diameter at the orifice, the lobes obliquely obovate-dolabriform, obtuse, 1.2–1.4 cm. long, widely spreading to somewhat reflexed; anthers 1.2–1.3 cm. long, minutely hirtellous dorsally; ovary about 0.2 cm. long, minutely ferruginous-tomentulose; nectaries essentially equal, fleshy, about equalling the ovary; follicles unknown.

COLOMBIA: MAGDALENA: forest near a stream, alt. 2000 ft., vicinity of Santa Marta, June 27, 1899, *Smith 2412* (G, MBG, TYPE, NY, US).

VENEZUELA: CARABOBO: Guaremales, road from Puerto Cabello to San Felipe, in forest, alt. 350 m., July 2, 1920, *Pittier 8920* (G, NY, US).

Mr. Smith describes his plant as a vine 25 feet tall, with "corolla green, lobes pale yellowish green."

4. *Peltastes peltatus* (Vell.) Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932.

*Echites peltata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 32.

1827; A. DC. in DC. Prodr. 8: 465. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 159. pl. 53, fig. 2. 1860.

*Echites plicata* A. DC. loc. cit. 454. 1844.

*Echites macrocalyx* Muell.-Arg. loc. cit. 160. 1860.

*Stipecoma peltata* (Vell.) Miers, Apoc. So. Am. 134. 1878.

*Stipecoma plicata* (A. DC.) Miers, loc. cit. 1878.

*Stipecoma pulchra* Miers, loc. cit. 135. pl. 18. 1878.

*Stipecoma mucronata* Miers, loc. cit. 1878.

*Stipecoma macrocalyx* (Muell.-Arg.) Miers, loc. cit. 136. 1878.

*Stipecoma speciosa* Miers, loc. cit. 1878.

*Stipecoma ovata* Miers, loc. cit. 137. pl. 19. 1878.

*Stipecoma parabolica* Miers, loc. cit. 1878.

*Peltastes macrocalyx* (Muell.-Arg.) Woodson, loc. cit. 1932.

Stems relatively stout, densely ferruginous-lanulose when young, becoming glabrate; leaves opposite, broadly ovate to obovate-oval, apex very shortly acuminate to essentially rounded, base broadly rounded to subtruncate, 5–30 cm. long, 2.5–18 cm. broad, firmly membranaceous, above glabrous, or very indefinitely papillate when young, beneath minutely and persistently ferruginous-lanulose; petioles 1.8–10.0 cm. long, minutely and persistently ferruginous-lanulose; inflorescence 5–20 flowered, the peduncle densely ferruginous-lanulose, about equalling the subtending petioles; pedicels 1.0–1.3 cm. long, minutely ferruginous-lanulose; bracts oblong-spathulate, foliaceous, 0.7–1.5 cm. long; calyx-lobes narrowly oblong to oblong-elliptic, acute to acuminate, 1.5–1.7 cm. long, minutely and rather sparsely ferruginous-puberulent without; corolla



infundibuliform, glabrous without, the proper-tube 0.9–1.0 cm. long, about 0.4–0.45 cm. in diameter at the base, the throat not directly dilated above the insertion of the stamens, differentiated into a more or less distinct upper- and lower-throat, the former 0.6–0.7 cm. long, scarcely broader than the proper-tube, the latter abruptly dilated, broadly campanulate, 0.8–0.9 cm. long, about 1.2–1.3 cm. in diameter at the orifice, the lobes obliquely dolabriform, shortly acuminate, 1.6–1.7 cm. long, somewhat spreading; anthers 1.1–1.2 cm. long, minutely hirtellous dorsally; ovary about 0.2 cm. long, finely ferruginous-puberulent to essentially glabrate; nectaries fleshy, essentially equal, about equalling the ovary; stigma 0.2 cm. long; follicles stout, falcate, usually persistently united at the tips, 15–25 cm. long, glabrous, or essentially so; seeds 2.0–2.5 cm. long, the pale tawny coma 5.0–5.5 cm. long.

BRAZIL: MINAS GERAES: Ilheus, 1859–60, *Wawra & Maly 241* (V); Serra de Caldas, Oct. 25, 1873, *Mosen 622* (C, S); Caldas, prope Rio de Machada, Nov., 1854 *Lindberg 191* (S); Caldas, Febr. 24, 1862, *Regnell III 883* (C, S, US); Lagoa Santa, date lacking *Warming s.n.* (C, NY); RIO DE JANEIRO: Serra d'Estrella, Nov. 15, 1874, *Glaziou 7753* (US); data incomplete, *Schott 5398* (V); *Widgren s.n.* (S); SÃO PAULO: Jaragua, "Buschwald," Dec. 22, 1912, *Brade 5688* (S); prope Rio Grande inter Santos et urbem S. Paulo, 1902, *Wacket s.n.* (C); DATA INCOMPLETE: *Mikan s.n.* (V); *Riedel s.n.* (G, V); *Glaziou 4879* (C); *Glaziou 11188* (C).

As specimens of *Peltastes* from southern Brazil have accumulated for study, the validity of *P. macrocalyx* has appeared more and more dubious. The pubescence of the ovary evidently does not distinguish it, as believed by Mueller, since the majority of specimens, doubtless of *P. peltatus* as shown by other characters, demonstrates to a greater or less degree much the same type of indument. Glabrate individuals are rare. Hence, it appears desirable to consolidate the two species, at least until such time when additional criteria will have been discovered. Miers' numerous species are all certainly insignificant variations of the frequent and widespread *P. peltatus* prompted largely by fluctuations of leaf size as well as by the relative abundance or sparsity of vegetative indument, largely reflecting the relative age of the portion of the plants selected as specimens.

**5. *Peltastes isthmicus* Woodson, spec. nov.**

Fruticosa volubilis; ramulis teretibus crassiusculis juventate dense ferrugineo-lanulosis tandem glabratibus; foliis oppositis longe petiolatis peltatis late ovatis apice abruptissime brevissimeque acuminatis basi late rotundatis 10–30 cm. longis 8–20 cm. latis firmiter membranaceis supra juventate sparse inconspicueque puberulo-papillatis mox glabratibus subtus juventate dense ferrugineo-lanulosis tandem glabratibus; petiolis 5–12 cm. longis ut in ramulo vestitis; inflorescentiis 10–15-floris pedunculo petiolis subaequante minute denseque ferrugineo-lanuloso; pedicellis 1.8–2.0 cm. longis ut in pedunculo vestitis; bracteis foliaceis oblongo-spathulatis 0.8–1.7 cm. longis; calycis laciniis oblongo-obovatis breviter subcaudato-acuminatis 2.8–3.0 cm. longis basi inconspicue puberulo-papillatis; corolla infundibuliformi extus glabra tubo proprio 2.3–2.5 cm. longo basi ca. 0.5 cm. diametro metiente faucibus basi prope insertionem staminum vix inflatis deinde late campanulatis 2.0–2.3 cm. longis ostio ca. 1.9–2.0 cm. diametro metiente lobis oblique obovatis haud acuminatis 3.5 cm. longis patulis; antheris 1.2 cm. longis dorso hirtellis; ovario ca. 0.18 cm. longo glabro; nectariis carnosissimis ovario subaequantibus; stigmatibus 0.2 cm. longo; folliculis crassis falcatis 22–25 cm. longis irregulariter ferrugineo-papillatis; seminibus haud visis.

Stems relatively stout, densely ferruginous-lanulose when young, becoming glabrate; leaves opposite, long-petiolate, peltate, broadly ovate, apex very abruptly and shortly acuminate, base broadly rounded, 10–30 cm. long, 8–20 cm. broad, firmly membranaceous, above sparsely and inconspicuously puberulent-papillate in youth, soon becoming glabrate, beneath densely ferruginous-lanulose when young, becoming glabrate; petioles 5–12 cm. long, indument as upon the stem; inflorescence 10–15-flowered, the peduncle about equalling the subtending petioles, minutely and densely ferruginous-lanulose; pedicels 1.8–2.0 cm. long, clothed as upon the peduncle; bracts foliaceous, oblong-spathulate, 0.8–1.7 cm. long; calyx-lobes oblong-ovate, shortly subcaudate-acuminate, 2.8–3.0 cm. long, inconspicuously puberulent-papillate at the base without;



corolla infundibuliform, glabrous without, the proper-tube 2.3-2.5 cm. long, about 0.5 cm. in diameter at the base, the throat broadly campanulate, 2.0-2.3 cm. long, about 1.9-2.0 cm. in diameter at the orifice, the lobes obliquely obovate, not acuminate, about 3.5 cm. long, spreading; anthers 1.2 cm. long, hirtellous dorsally; ovary about 0.18 cm. long, glabrous; nectaries fleshy, about equalling the ovary; stigma 0.2 cm. long; follicles stout, falcate, 22-25 cm. long, irregularly ferruginous-papillate; seeds not seen.

PANAMA: CHIRIQUI: vicinity of San Felix, alt. 0-120 m., Dec., 1911, *Pittier 5125* (US, TYPE, MBG, photograph).

COSTA RICA: GUANACASTE: Nicoya, 1900, *Tondus s.n.* (US).

The affinities of this species, notable as the sole Central American representative of a South American genus, are set forth in the key to species. The specimen collected by Tondus upon the Nicoya Peninsula of Costa Rica is relegated to this species merely upon presumption, as it is completely sterile.

6. *Peltastes giganteus* Woodson, Ann. Mo. Bot. Gard. 19: 378. 1932.

Stems relatively stout, densely ferruginous-lanulose when young, eventually becoming glabrate; leaves opposite, broadly ovate, apex very shortly and abruptly acuminate to obtuse, base broadly rounded, 18-35 cm. long, 9-20 cm. broad, firmly membranaceous to subcoriaceous, above minutely ferruginous-lanulose when very young, soon becoming glabrate, beneath persistently ferruginous-lanulose; petioles 7-12 cm. long, minutely ferruginous-lanulose when young, becoming glabrate; inflorescence 4-5-flowered, the peduncle somewhat shorter than the subtending petioles, minutely and densely ferruginous-lanulose; pedicels 1 cm. long, ferruginous-lanulose; bracts foliaceous, oblong-lanceolate, shortly acuminate, 0.8-2.0 cm. long; calyx-lobes obovate-oblong, obtuse, 0.8-1.5 cm. long, minutely puberulent-papillate toward the base, otherwise glabrous; corolla infundibuliform, glabrous without, the proper-tube 1.7-1.8 cm. long, about 0.35 cm. in diameter at the base, the throat narrowly conical or subtubular-conical, dilating almost directly above the insertion of the stamens, 1.8-2.0 cm. long, 0.8-

0.9 cm. in diameter at the orifice, the lobes obovate-dolabriform, acute, 1.0–1.3 cm. long, somewhat spreading; anthers 1.2 cm. long, lanulose dorsally; ovary about 0.25 cm. long, minutely lanulose; nectaries only slightly fleshy, irregularly cleft, about equalling the ovary; stigma 0.2 cm. long; follicles unknown.

BOLIVIA: data incomplete, *Bang* 2804 (MBG, TYPE, NY, US); *Bang* 2404 (C, US).

The tubular corolla-throat sets this species well apart from its congeners, as does the irregularly cleft nectary.

#### XIV. *STIPECOMA* Muell.-Arg.

*Stipecoma* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 175. 1860; Miers, Apoc. So. Am. 132. 1878, in part; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 166. 1895.

Glabrous, suffruticose lianas. Stems volubile, terete; branches usually opposite below (?), becoming alternate above. Leaves opposite, petiolate, the blade peltate, penninerved, eglandular, entire or slightly sinuous, rigidly chartaceous or subcoriaceous; petioles very obscurely girdling at the node. Inflorescence a lateral, alternate, bostrychoid raceme. Flowers pedicellate, subtended by 1–3 scarious bracts. Calyx 5-parted, the lobes equal or subequal, cleft nearly to the receptacle, scarious, bearing few to several internal, glandular squamellae in groups alternate with the lobes. Corolla salverform, the tube cylindrical, somewhat dilated at the insertion of the stamens, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, epipetalous, the anthers coherent, consisting of 2 longitudinal, apically convergent, bilocular sporangia borne ventrally near the apex of an enlarged, sagittate, acutely biauriculate, dorsally pilose connective, the filament subcylindrical, pilose, the pollen granular. Carpels 2, subinferior, apocarpous, united at the apex by an elongate, stylar shaft surmounted by the fusiform stigma; ovules many, borne upon an axile, binate placenta. Nectaries 5, conerescent or essentially so. Follicles 2, apocarpous, terete, continuous, dehiscing along the ventral suture, containing many dry, rostrate, apically comose seeds; embryo straight, typically dicotyledonous.

Type species: *Stipecoma peltigera* (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 176. 1860.

1. *Stipecoma peltigera* (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 176. pl. 53, fig. 1. 1860; Miers, Apoc. So. Am. 133. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 166. 1895.

*Echites peltigera* Stadelm. Flora 24<sup>1</sup>: Beibl. 21. 1841; A. DC. in DC. Prodr. 8: 447. 1844.

*Echites tropaeolifolia* A. DC. loc. cit. 1844.

Glabrous, suffruticose lianas; stems terete, relatively slender; leaves opposite, petiolate, the blade peltate, rigidly chartaceous to subcoriaceous, ovate, apex acuminate, base rather broadly rounded, 4-6 cm. long, 3.0-4.5 cm. broad, the petiole 2.5-3.0 cm. long; inflorescence usually somewhat surpassing the length of the subtending leaves, bearing 5-14 "obscurely rose-colored" flowers; pedicels 0.75 cm. long, somewhat accrescent in fruit, the subtending bracts scarious, minute; calyxlobes ovate, broadly acute, about 0.2 cm. long, scarious; corolla salverform, the tube cylindrical, about 1.5 cm. long, somewhat dilated at the insertion of the stamens, the lobes obliquely obovate, acuminate, about equalling the length of the tube, widely spreading; stamens inserted about midway within the corolla-tube, the anthers rather narrowly sagittate, pilose dorsally toward the tip; ovary oblongoid, glabrous, rather gradually produced into the style; stigma fusiform; nectaries concrescent, variously lobed and cleft, nearly equalling the ovary; follicles as in the generic description.

BRAZIL: GOYAZ: ad Serra d'Ourada, date lacking, Pohl 1592 (V, COTYPE, MBG, photograph).

The description and dimensions of the flowers and reproductive organs have been taken from the original account by Mueller, since the one specimen available for my study is sterile. Mueller cited this species from the provinces of Bahia (*Martius s.n.*) and Minas Geraes (*St. Hilaire s.n.*), as well as listing additional collections in Goyaz by Weddell (*s.n.*) and Riedel (932). These specimens have not been available for study, and

the species, apparently rare in the field, has not been represented in recent collections available for examination.

*Stipecoma* simulates *Peltastes* in its peltate leaves, but differs in its salverform corolla, scarious calyx-lobes with relatively few, alternate squamellae, and more narrowly rostrate seeds.

#### EXCLUDED SPECIES

The following are apparently all referable to *Peltastes peltatus* (Vell.) Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932 (*Echites peltata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 32. 1827):

*Stipecoma macrocalyx* (Muell.-Arg.) Miers, Apoc. So. Am. 136. 1878 (*Echites macrocalyx* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 160. 1860).

*Stipecoma mucronata* Miers, Apoc. So. Am. 135. 1878.

*Stipecoma ovata* Miers, Apoc. So. Am. 137. pl. 19. 1878.

*Stipecoma parabolica* Miers, Apoc. So. Am. 137. 1878.

*Stipecoma peltata* (Vell.) Miers, Apoc. So. Am. 134. 1878.

*Stipecoma plicata* (A. DC.) Miers, Apoc. So. Am. 134. 1878 (*Echites plicata* A. DC. in DC. Prodr. 8: 454. 1844).

*Stipecoma pulchra* Miers, Apoc. So. Am. 135. pl. 18. 1878.

*Stipecoma speciosa* Miers, Apoc. So. Am. 136. 1878.

#### XV. ANGADENIA Miers, char. emend.

**Angadenia** Miers, Apoc. So. Am. 173. 1878, in part.

Lactescent, suffruticose or suffrutescent undershrubs. Stems erect, decumbent, or voluble, terete; branches alternate. Leaves opposite, petiolate to sessile, coriaceous to subcoriaceous, eglandular, entire, penninerved, the petioles somewhat girdling at the node into a slightly dilated, minutely appendiculate, stipular ring. Inflorescence lateral, infrequently terminal, alternate, scorpioid; peduncle simple or dichotomously compound at the base, usually more or less conspicuously flexuous. Flowers white to pale yellow. Calyx 5-parted, the lobes equal, imbricated, cleft nearly to the receptacle, bearing within 1-2 alternate squamellae. Corolla infundibuliform,

the tube straight, narrowly cylindrical below, somewhat below midway staminiferous and abruptly dilated into the broad, campanulate or tubular throat, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, inserted slightly below midway within the corolla-tube, wholly included; anthers connivent and agglutinated to the stigma, consisting of 2 apically convergent, basally protuberant sporangia borne ventrally near the apex of an enlarged, sagittate, acutely 2-auriculate connective; pollen granular. Carpels 2, united at the apex by an elongate, stylar shaft surmounted by the fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, usually concrescent, occasionally more or less separate. Follicles 2, apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, narrowly rostrate, apically comose seeds.

Type species: *Angadenia Berterii* (A. DC.) Miers, Apoc. So. Am. 180. 1878.

#### KEY TO THE SPECIES

- a. Corolla 3.7-4.5 cm. long, the throat tubular; inflorescence usually dichotomous below.....1. *A. Lindeniana*
- aa. Corolla 2.5-3.4 cm. long, the throat conical to campanulate; inflorescence usually simple.....2. *A. Berterii*

1. ***Angadenia Lindeniana*** (Muell.-Arg.) Miers, Apoc. So. Am. 180. 1878.

*Rhabdadenia Lindeniana* Muell.-Arg. Linnaea 30: 437. 1860.

*Rhabdadenia Lindeniana* Muell.-Arg.  $\beta$  *angustifolia* Muell.-Arg. loc. cit. 438. 1860.

*Echites Lindeniana* (Muell.-Arg.) Griseb. Cat. Pl. Cub. 173. 1866.

Suffruticose or suffrutescent lianas; stems relatively slender, sparsely pilosulose to glabrate; leaves opposite, distinctly petiolate, broadly elliptic to oblong-lanceolate, apex acuminate, base obtuse, 2.0-6.5 cm. long, 1.5-3.0 cm. broad, firmly membranaceous, glabrous throughout, or very sparsely pilosulose when young, nitidulous above, opaque beneath; petioles 0.5-0.8 cm. long, glabrous or glabrate; inflorescence lateral, or infre-



quently subterminal, scorpioid, usually dichotomous below, bearing 6–18 showy, cream-colored flowers; peduncle usually about twice surpassing the subtending leaves, glabrous, or rarely very minutely puberulent; pedicels 1.0–1.2 cm. long, somewhat accrescent in fruit, glabrous or essentially so; bracts scarious, minutely ovate-lanceolate; calyx-lobes ovate-lanceolate, acuminate, 0.3–0.4 cm. long, scarious, glabrous, the squamellae 2–3; corolla infundibuliform, glabrous without, the proper-tube 0.7–1.3 cm. long, about 0.2–0.25 cm. in diameter at the base, the throat tubular, 1.5–2.0 cm. long, about 0.6–0.8 cm. in diameter at the orifice, the lobes obliquely obovate, 1.2–1.5 cm. long, widely spreading; anthers oblong-elliptic, narrowly sagittate, 0.45–0.5 cm. long, glabrous or essentially so; ovary ovoid, about 0.15 cm. long, glabrous; nectaries concrescent or essentially so, nearly twice surpassing the ovary; stigma about 0.1 cm. long; mature follicles unknown.

CUBA: MATANZAS: Arroyo Grande ad Jagüey, alt. 600 m., April, 1889, *Eggers 5297* (B, US); ORIENTE: wooded hills, vicinity of Santiago, March 10–25, 1912, *Britton Britton & Cowell 12848* (MBG, NY); in dense woods, exact locality lacking, July 21, 1859, *Wright 1376* (S, V); DATA INCOMPLETE: *Swartz s.n.* (S); *Linden 1699* (V).

JAMAICA: upper slopes of Mt. Diablo, alt. 500–800 m., Febr. 25–28, 1920, *Maxon & Killip 394* (US).

Relegation of *Maxon & Killip 394* to this species is not made with great assurance, as the corolla, preserved in only one instance, is much narrower, with respect to both proper-tube and throat, than in the Cuban specimens. Furthermore, it must be recalled that the apocynaceous floras of Cuba and Jamaica, at least in the highlands, are ordinarily specifically distinct.

**2. *Angadenia Berterii* (A. DC.) Miers, Apoc. So. Am. 180. 1878.**

*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844.

*Echites Sagraei* A. DC. loc. cit. 450. 1844.

*Echites ferruginea* A. Rich. in Sagra, Hist. Cuba 11: 92. 1850.

*Rhabdadenia Berteri* (A. DC.) Muell.-Arg. Linnaea 30: 435. 1860.

- Rhabdadenia Sagraei* (A. DC.) Muell.-Arg. loc. cit. 1860.  
*Rhabdadenia cubensis* Muell.-Arg. loc. cit. 1860.  
*Echites cubensis* (Muell.-Arg.) Griseb. Cat. Pl. Cub. 172.  
1866.  
*Angadenia Sagraei* (A. DC.) Miers, loc. cit. 181. 1878.  
*Angadenia Havanensis* Miers, loc. cit. 1878.  
*Angadenia Cubensis* (Muell.-Arg.) Miers, loc. cit. 182.  
1878, where erroneously referred to Grisebach.  
*Secondatia ferruginea* (A. Rich.) Miers, loc. cit. 227. 1878.  
*Rhabdadenia corallicola* Small, Bull. N. Y. Bot. Gard. 3:  
434. 1905.

Suffrutescent lianas, not rarely erect or suberect in their northern range; stems sparsely pilosulose to glabrate; leaves opposite, shortly petiolate to subsessile, ovate-elliptic to oblong-linear, apex acuminate to obtuse, not infrequently mucronulate, base obtuse, rarely obscurely cordate, 1-7 cm. long, 0.3-2.0 cm. broad, membranaceous to subcoriaceous, above glabrous, usually somewhat nitidulous, beneath opaque, glabrous, or minutely puberulent along the midrib; petioles 0.1-0.5 cm. long, occasionally essentially suppressed; inflorescence lateral in voluble specimens, subterminal to terminal in erect specimens, scorpioid, usually simple, infrequently dichotomous, bearing 5-30 cream-colored or yellowish flowers; peduncle twice or more surpassing the subtending leaves, glabrous to very minutely puberulent; pedicels 1.0-1.5 cm. long, glabrous to very minutely puberulent; bracts lanceolate, 0.1 cm. long or less, scarious; calyx-lobes ovate-lanceolate, acuminate, 0.3-0.5 cm. long, scarious, glabrous to very minutely puberulent-papillate without, the squamellae 1-2-3; corolla infundibuliform, glabrous to very indefinitely papillate without, the proper-tube 0.5-0.8 cm. long, about 0.2 cm. in diameter at the base, the throat broadly conical to campanulate, 1.0-1.5 cm. long, about 0.5-0.9 cm. in diameter at the orifice, the lobes obliquely obovate-dolabriform to subreniform-dolabriform, 1.0-1.3 cm. long, widely spreading; anthers subtrigonal, obtuse to acute, narrowly sagittate, 0.3-0.4 cm. long, indefinitely puberulent-papillate dorsally; ovary ovoid, about 0.1 cm. long,



glabrous; nectaries conerescent, about equalling the ovary, extremely variable and not infrequently more or less separate; stigma about 0.1 cm. long; follicles slender, divaricate, continuous, 5–10 cm. long, glabrous; seeds 0.5 cm. long, the pale yellowish coma about 2 cm. long.

UNITED STATES: FLORIDA: Miami, Dade Co., June, 1877, *Garber 11957* (MBG); pinelands, Miami, April 30, 1930, *Duckett s.n.* (MBG); in dry sandy marl, Goulds, Jan. 12, 1930, *Moldenke 399a* (MBG, NY); Big Pine Key, May, 1891, *Simpson 251* (US).

BAHAMA ISLANDS: near Nassau, April 25, 1903, *Curtiss 178* (MBG, US); in pinetis, New Providence, Febr. 28, 1888, *Eggers 4315* (US).

CUBA: ISLA DE PINOS: near Nueva Gerona, March 10–April 2, 1904, *Curtiss 395* (MBG); PINAR DEL RIO: palm barrens, west of Guane, Nov. 21–22, 1911, *Shafer 10428* (MBG, US); St. Yago de Cuba [Santiago], 1844, *Linden 2167* (V); mountains near El Guama, among grass on hillside, March 9, 1900, *Palmer & Riley 207* (US); trailing through bushes of sand swamp near seashore, near Coloma, March 18, 1900, *Palmer & Riley 337* (US); HABANA: Guanabacoa, date lacking, *Poeppig 537* (V); DATA INCOMPLETE: *Wright 2955* (MBG, S, V); *Sagra s.n.* (V).

HISPANIOLA: SANTO DOMINGO: in sylvis, alt. 100 m., April 26, 1887, *Eggers 1686* (B, US); La Jina, Distr. Moncion, Prov. Monte Cristy, April 19, 1933, *Valeur 978* (MBG).

The specimens from Santo Domingo demonstrate something of a transition to *A. Lindeniana* in the shape of the corolla-throat, which is nearly subtubular. The anthers are subtriangular, however, as in specimens of *A. Berterii* as interpreted above, from Cuba, the Bahamas, and Florida. This species is bewildering in its variations, particularly with regard to posture and shape of foliage. It would doubtless be indiscrete to segregate upon the present state of our knowledge.

The genus *Angadenia* as conceived by Miers is a hodge-podge of various elements, chiefly referable to *Odontadenia*, as the following list of excluded species testifies. After the removal of numerous species included within it by Miers but more properly referable to older genera, a distinct element centering about *Echites Berterii* A. DC. and *Rhabdadenia Lindeniana* Muell.-Arg. remains as a residue of manifestly related entities which form the genus *Angadenia* as here emended. As outlined by Mueller (loc. cit. 1860), these species differ from *Rhabdadenia* chiefly in the presence of calycine squamellae, although certain poorly defined characters of general aspect

might be mentioned in support of their segregation, among the more prominent of which is the extensive, zig-zag, scorpioid inflorescence of the former.

## EXCLUDED SPECIES

*Angadenia Almadensis* (Stadelm.) Miers, Apoc. So. Am. 179. 1878 (*Echites almadensis* Stadelm. Flora 24<sup>1</sup>: Beibl. 28. 1841) = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792, not R. & P.).

*Angadenia Amazonica* (Stadelm.) Miers, Apoc. So. Am. 175. 1878 (*Echites amazonica* Stadelm. Flora 24<sup>1</sup>: Beibl. 50. 1841) = **Odontadenia verrucosa** (R. & S.) K. Sch. ex Mgf. in Pulle, Fl. Surinam 4: 53. 1932 (*Echites verrucosa* R. & S. Syst. 4: 795. 1819).

*Angadenia cognata* (Stadelm.) Miers, Apoc. So. Am. 176. 1878 (*Echites cognata* Stadelm. Flora 24<sup>1</sup>: Beibl. 79. 1841) = **Odontadenia cognata** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 18: 546. 1931.

*Angadenia coriacea* (Benth.) Miers, Apoc. So. Am. 177. 1878 (*Echites coriacea* Benth. in Hook. Jour. Bot. 3: 249. 1841) = **Odontadenia geminata** (R. & S.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 119. 1860 (*Echites geminata* R. & S. Syst. 4: 795. 1819).

*Angadenia Cururu* (Mart.) Miers, Apoc. So. Am. 175. 1878 (*Echites Cururu* Mart. in Buchn. Rep. Pharm. 101. 1830) = **Odontadenia puncticulosa** (A. Rich.) Pulle, Enum. Pl. Surinam 383. 1906 (*Echites puncticulosa* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Angadenia elegans* (Benth.) Miers, Apoc. So. Am. 178. 1878 (*Echites elegans* Benth. in Hook. Jour. Bot. 3: 249. 1841) = **Odontadenia geminata** (R. & S.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 119. 1860 (*Echites geminata* R. & S. Syst. 4: 795. 1819).

*Angadenia elliptica* Miers, Apoc. So. Am. 180. 1878. Based upon Gardner 2663 collected at Paranagua, State of Parana, Brazil, which has not been available for study. The unusually meager description appears to refer to **Odontadenia gracilipes**

(Stadelm.) Woodson, Ann. Mo. Bot. Gard. 22: 294. 1935 (*Echites gracilipes* Stadelm. Flora 24<sup>1</sup>: Beibl. 22. 1841), which is at present known only from the State of Minas Geraes.

*Angadenia geminata* (R. & S.) Miers, Apoc. So. Am. 178. 1878 (*Echites geminata* R. & S. Syst. 4: 795. 1819) = **Odontadenia geminata** (R. & S.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 119. 1860.

*Angadenia grandifolia* (Stadelm.) Miers, Apoc. So. Am. 175. 1878 (*Echites Cururu* Mart. var.  $\beta$  *grandifolia* Stadelm. Flora 24<sup>1</sup>: Beibl. 79. 1841) = **Odontadenia puncticulosa** (A. Rich.) Pulle, Enum. Pl. Surinam, 383. 1906 (*Echites puncticulosa* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Angadenia hypoglauca* (Stadelm.) Miers, Apoc. So. Am. 173. 1878 (*Echites hypoglauca* Stadelm. Flora 24<sup>1</sup>: Beibl. 23. 1841) = **Odontadenia hypoglauca** (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 118. 1860.

*Angadenia latifolia* (Muell.-Arg.) Miers, Apoc. So. Am. 176. 1878 (*Anisolobus amazonicus* (Stadelm.) Muell.-Arg.  $\beta$  *latifolius* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 114. 1860) = **Odontadenia verrucosa** (R. & S.) K. Sch. ex Mgf. in Pulle, Fl. Surinam 4: 53. 1932 (*Echites verrucosa* R. & S. Syst. 4: 795. 1819).

*Angadenia majuscula* Miers, Apoc. So. Am. 174. 1878 = **Odontadenia hypoglauca** (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 118. 1860 (*Echites hypoglauca* Stadelm. Flora 24<sup>1</sup>: Beibl. 23. 1841).

*Angadenia nitida* (Vahl) Miers, Apoc. So. Am. 177. 1878 (*Echites nitida* Vahl, Eclog. 2: 19. pl. 13. 1798) = **Odontadenia nitida** (Vahl) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 118. 1860.

*Angadenia pandurata* (A. DC.) Miers, Apoc. So. Am. 182. 1878 (*Echites pandurata* A. DC. in DC. Prodr. 8: 458. 1844) = **Fernaldia pandurata** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 48. 1932.

*Angadenia Pöppigii* (Muell.-Arg.) Miers, Apoc. So. Am. 179. 1878 (*Odontadenia Poeppigii* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 119. 1860) = **Odontadenia geminata** (R. & S.) Muell.-Arg. loc. cit. 119. 1860 (*Echites geminata* R. & S. Syst. 4: 795. 1819).

*Angadenia Prieurii* (A. DC.) Miers, Apoc. So. Am. 182. 1878, err. typ. (*Echites Prieurei* A. DC. in DC. Prodr. 8: 458. 1844) = **Mandevilla subspicata** (Vahl) Mgf. Rec. Trav. Bot. Néerl. 22: 380. 1926 (*Echites subspicata* Vahl, Eclog. Am. 2: 18. 1798).

*Angadenia pruinosa* Miers, Apoc. So. Am. 177. 1878. Based upon *Gardner 2232*, collected at Oeiras, Para, Brazil. Miers expressed the opinion (loc. cit.) that "The follicles and seeds exactly correspond with those of *A. hebecarpus*, showing that it belongs to this genus." Miers evidently referred to **Odontadenia lutea** (Vell.) Mgf. in Fedde, Rep. Sp. Nov. 20: 24. 1924 (*Echites lutea* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 25. 1827) = *Anisolobus hebecarpus* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 111. pl. 33. 1860, although he did not formally transfer that species to *Angadenia*, doubtless through oversight.

*Angadenia reticulata* Miers, Apoc. So. Am. 179. 1878 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Angadenia Sprucei* (Muell.-Arg.) Miers, Apoc. So. Am. 176. 1878 (*Anisolobus Sprucei* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 114. 1860) = **Odontadenia verrucosa** (R. & S.) K. Sch. ex Mgf. in Pulle, Fl. Surinam 4: 53. 1932 (*Echites verrucosa* R. & S. Syst. 4: 795. 1819).

*Angadenia sylvestris* (A. DC.) Miers, Apoc. So. Am. 174. 1878 (*Echites sylvestris* A. DC. in DC. Prodr. 8: 464. 1844) = **Odontadenia Hoffmannseggiana** (Steud.) Woodson, ex Gleason & A. C. Smith, Bull. Torrey Bot. Club 60: 392. 1933 (*Echites Hoffmannseggiana* Steud. Nomencl. ed. 2. 1: 539. 1840).

*Angadenia Valenzuelana* (A. Rich.) Miers, Apoc. So. Am. 181. 1878 (*Echites Valenzuelana* A. Rich. in Sagra, Hist. Cuba 11: 93. 1850) = **Neobrachea Valenzuelana** (A. Rich.) Urb. Symb. Ant. 9: 241. 1924.

#### XVI. URECHITES Muell.-Arg.

**Urechites** Muell.-Arg. Bot. Zeit. 18: 22. 1860; Benth. & Hook. Gen. Pl. 2: 727. 1876; Miers, Apoc. So. Am. 124. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Chariomma* Miers, loc. cit. 110. 1878.

Lactescent fruticose or suffruticose lianas. Stems volubile, infrequently suberect, terete; branches alternate, or opposite below. Leaves opposite or rarely subverticillate, petiolate, membranaceous to subcoriaceous, eglandular, entire, penninerved, the petioles subtended by an inconspicuously appendiculate, interpetiolar, stipular ring. Inflorescence lateral to subterminal or terminal, simply scorpioid, bearing few to many showy, yellowish or cream-colored flowers; peduncle straight to slightly flexuous, conspicuously bracteate. Calyx 5-parted, the lobes equal to subequal, imbricated, cleft nearly to the receptacle, bearing within paired alternate, or numerous indefinitely distributed squamellae. Corolla infundibuliform, the tube straight, about midway, or somewhat lower, stamiferous, and abruptly dilated into a broad, tubular throat, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, wholly included, or the appendages somewhat exerted; anthers connivent and agglutinated to the stigma, consisting of 2 apically convergent, basally protuberant sporangia borne ventrally near the apex of an enlarged, sagittate, acutely 2-auriculated connective bearing, except rarely, conspicuous, spirally coiled, linear, apical appendages; pollen granular. Carpels 2, united at the apex by an elongate, stylar shaft surmounted by the capitate-fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, concrescent or essentially separate. Follicles 2, apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, narrowly rostrate, apically comose seeds mingled with subtending, subscaphiform, placental chaff.

Type species: *Urechites lutea* (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907.

#### KEY TO THE SPECIES

- a. Calyx-lobes linear-lanceolate, acuminate, usually equalling or slightly surpassing the proper-tube of the corolla; squamellae numerous, indefinitely distributed; nectaries essentially separate; plants of southern peninsular Florida, the Bahama Islands, the Antilles, rarely locally in northern Atlantic coastal Central America.....1. *U. lutea*



- aa. Calyx-lobes ovate, obtuse, much shorter than the proper-tube of the corolla; squamellae paired, alternate with the calyx-lobes; nectaries conercent; plants of northern Central America.....2. *U. Andrieuxii*

1. *Urechites lutea* (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907.

*Vinca lutea* L. Cent. II. Pl. 12. 1756.

*Echites suberecta* Jacq. Enum. Pl. Carib. 13. 1760.

*Echites domingensis* Jacq. Ic. Rar. 1: 6. pl. 26. 1782.

*Echites heterophylla* J. F. Gmel. Syst. 2: 437. 1791, not Miq.

*Echites barbata* Desv. ex Ham. Prodr. 30. 1825.

*Echites Catesbaei* G. Don, Gen. Hist. 4: 74. 1838.

*Haemadictyon suberectum* (Jacq.) G. Don, loc. cit. 83. 1838.

*Neriandra suberecta* (Jacq.) A. DC. in DC. Prodr. 8: 422. 1844.

*Dipladenia flava* Hook. Bot. Mag. 79: pl. 4702. 1853.

*Echites Peltieri* Loud. Encycl. 1541. 1855, nom. nud. in synon.

*Echites Andrewsii* Chapm. Fl. So. U. S. 359. 1860.

*Urechites Jaegeri* Muell.-Arg. Linnaea 30: 443. 1860.

*Urechites suberecta* (Jacq.) Muell.-Arg. loc. cit. 444. 1860; Miers, Apoc. So. Am. 125. 1878.

*Urechites suberecta* (Jacq.) Muell.-Arg.  $\beta$  *glabrata* Muell.-Arg. loc. cit. 444. 1860.

*Urechites suberecta* (Jacq.) Muell.-Arg.  $\gamma$  *rotundifolia* Muell.-Arg. loc. cit. 1860.

*Echites neriandra* Griseb. Fl. Brit. W. I. 415. 1861.

*Echites jamaicensis* Griseb. loc. cit. 416. 1861.

*Chariomma surrecta* Miers, loc. cit. 111. 1878.

*Nerium sarmentosum* P. Browne, ex Miers, loc. cit. 111. 1878, err. in synon.

*Chariomma Domingensis* (Jacq.) Miers, loc. cit. 112. 1878.

*Chariomma mucronulata* Miers, loc. cit. 112. 1878.

*Chariomma flava* (Hook.) Miers, loc. cit. 113. 1878.

*Chariomma verticillata* Miers, loc. cit. 1878.

*Chariomma scandens* Miers, loc. cit. 114. 1878.



- Rhabdadenia laxiflora* Miers, loc. cit. 120. 1878.  
*Rhabdadenia barbata* (Desv.) Miers, loc. cit. 123. 1878.  
*Laubertia urechites* Griseb. ex Miers, loc. cit. 125. 1878,  
err in synonym.  
*Urechites Neriandra* Griseb. ex Miers, loc. cit. 126. 1878,  
err in synonym.  
*Laseguea Jaegeri* (Muell.-Arg.) Miers, loc. cit. 254. 1878.  
*Laseguea pubiflora* Miers, loc. cit. 253. 1878.  
*Echites obovata* Sesse & Moc. Fl. Mex. 43. 1887, not Nees,  
fide Urb. Symb. Ant. 4: 496. 1903.  
*Urechites Andrewsii* (Chapm.) Small, Fl. Southeast. U. S.  
936. 1903.  
*Urechites dolicantha* Urb. Symb. Ant. 6: 38. 1909.  
*Urechites pinetorum* Small, Addisonia 4: 21. pl. 131.  
1919.  
*Urechites lutea* (L.) Britton var. *angustifolia* Ekm. & Hel-  
wig, Arkiv f. Bot. 22A<sup>10</sup>: 46. 1929.

An extremely variable species. Stems volubile or occasion-  
ally suberect, relatively stout, glabrous to densely pilose;  
leaves opposite, shortly petiolate, oblong-linear to subrotund,  
apex shortly acuminate to obtuse or rounded, base obtuse to  
obscurely cordate, 3–9 cm. long, 0.5–6.0 cm. broad, membrana-  
ceous to subcoriaceous, either surface glabrous to pilose; pet-  
ioles 0.2–1.2 cm. long; inflorescence lateral, alternate, occasion-  
ally subterminal or terminal, the peduncle usually somewhat  
surpassing the subtending leaves, occasionally somewhat  
shorter, generally more or less pilose, rarely glabrate, bearing  
few to relatively many handsome, yellowish or cream-colored  
flowers; pedicels 1.0–1.5 cm. long, usually somewhat pilosulose,  
less frequently glabrate; bracts foliaceous, ovate to ovate-  
lanceolate, 0.2–0.8 cm. long; calyx-lobes linear-lanceolate, acu-  
minate, 0.8–1.7 cm. long, usually more or less pilose or pilosu-  
lose, infrequently glabrate, the squamellae numerous, indefi-  
nitely distributed; corolla infundibuliform, glabrous to laxly  
pilose without, the proper-tube rather narrowly cylindrical,  
0.6–1.5 cm. long, about 0.2 cm. in diameter at the base, the throat  
broadly tubular to tubular-subconical, 1.5–3.5 cm. long, about

0.8–1.2 cm. in diameter at the orifice, the lobes obliquely obovate, 1.8–3.0 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers 0.5–0.55 cm. long, minutely puberulent dorsally, the apical appendages 1.3–1.7 cm. long, usually more or less exserted; ovary ovoid, about 0.1 cm. long, glabrous or essentially so; nectaries essentially separate or more or less concrescent at the base, about equaling the ovary; stigma 0.125 cm. long; follicles relatively stout, acuminate, continuous, 8–20 cm. long, glabrous to more or less densely pilosulose; seeds 0.7–1.1 cm. long, the pale tawny coma 1.5–3.0 cm. long, the placental chaff 1.0–1.3 cm. long.

UNITED STATES: FLORIDA: shrub on midden, Coconut, Lee Co., Febr. 19, 1930, *Moldenke 5784* (NY); in dry sandy soil along roadside, near Caxambos, Collier Co., April 17, 1930, *Moldenke 1006a* (NY); rich thickets, Upper Metacombe Key, in coral soil, July, year lacking, *Curtiss 2267* (MBG, NY, US); pinelands, west of Coconut Grove, May 15, 1918, *Small 8786* (NY); in pinelands, between Homestead and Camp Jackson, May 4–11, 1904, *Small & Wilson 1756* (NY); hammocks, Big Pine Key, Dec. 2, 1912, *Small 3995* (NY); pinelands between Miami and Kendall Station, Nov. 5, 1906, *Small & Carter 2654* (NY); hammocks, Grassy Key, Jan. 28–29, 1909, *Small & Carter 3116* (NY); Key West, Aug., 1887, *Garber s.n.* (US).

BAHAMA ISLANDS: near Nassau, New Providence, April–May, 1903, *Curtiss 172* (MBG, NY, US); coppice, near Deep Creek, Long Bay Cays section, Andros, Jan. 20–22, 1910, *Small & Carter 8605* (NY, US); scrub, Mathew Town, Oct. 10, 1904, *Nash & Taylor 898* (NY); scrublands, Cockburn Town and vicinity, Watling's, March 12–13, 1907, *Britton & Millspaugh 6093* (NY); Spring Point, Acklin's, Dec. 21, 1905–Jan. 6, 1906, *Brace 4273* (NY); coppice, Grand Turk, Aug. 27–Sept. 1, 1905, *Nash & Taylor 3773* (NY, US); West End, Great Bahama, April 16–May 8, 1905, *Brace 3601* (NY); Crooked Is., Nov., 1881, *Hitchcock s.n.* (MBG); Governor's Harbor, Nov. 15, 1890, *Hitchcock s.n.* (MBG).

CUBA: PINAR DEL RIO: climbing over bushes of sandy swamp near the shore, near Coloma, March 18, 1900, *Palmer & Riley 364* (NY, US); oak grove north of San Diego de los Baños, June 28, 1915, *Leon 5108* (NY); ISLA DE PINOS: swamp, climber over bushes, near Nueva Gerona, July 5, 1900, *Palmer & Riley 1010* (US); on coral soil, north of Caleta Grande, May 22, 1910, *Jennings 463B* (NY); HABANA: in swamp near seashore, near Playa de Marianao, June 17, 1900, *Palmer & Riley 833* (US); near Morro Castle, May 20, 1908, *Leon 712* (NY); MATANZAS: Cardenas, Sept. 1, 1903, *Britton & Wilson 190* (NY); SANTA CLARA: Cienegueta, May 9, 1895, *Combs 13* (MBG, US); coastal thicket, Rio Arimao, March 22, 1910, *Britton & Wilson 5809* (NY); CAMAGUEY: vicinity of La Gloria, Febr. 4, 1909, *Shafer 297* (NY, US); Cayo Paredon Grande, Oct. 25, 1909, *Shafer 2748* (NY, US); ORIENTE: woods, Alto Cedro to Paso Estancia, April 28, 1909, *Shafer 1624* (NY, US); coastal thicket, Fisherman's Point, Guantanamo Bay, March 17–30, 1909, *Britton 2110* (NY, US).

JAMAICA: roadside, Constant Spring, Aug. 29–31, 1907, *Britton 961* (NY);

banks, Balaclava, Cockpit Country, Sept. 13-18, 1906, *Britton 423* (NY); climbing on roadside banks, vicinity of Montego Bay, March 28-30, 1920, *Mazon & Killip 1440* (NY, US); rocks, Navy Island, July 14, 1897, *Fredholm 3163* (US); climbing over shrubs, Holly Mts., Mt. Diablo, alt. 3000 ft., Aug. 31, 1905, *Harris 9007* (NY); Lititz Savanna, July 7, 1914, *Harris 11732* (MBG, NY, US); near Castleton, alt. 500 ft., June 26, 1915, *Harris 12085* (MBG, NY, US).

HISPANIOLA: SANTO DOMINGO: sandy roadside, Haina, April 3, 1921, *Faris 119* (US); district of Moncion, Prov. Monte Cristy, Aug. 12, 1929, *Valeur 175* (MBG, US); Azua, March, 1913, *Rose Fitch & Russell 3960* (US); Paradis, pr. Barahona, in fruticetis litoralibus, Dec., 1909, *Tuerckheim 2638* (NY, US); HAITI: windswept rocky beach east of Cabaret, Jan. 14, 1929, *Leonard & Leonard 11986* (US); dry thickets east of harbor, vicinity of La Vallee, Tortue Island, Jan. 5, 1929, *Leonard & Leonard 11642* (US); Massif de la Hotte, Jeremie, between Sources-Chaudes and Source-Cahouane, July 4, 1928, *Ekman 10224* (US); Bayeux, near Port Margot, Aug. 4, 1903, *Nash 135* (NY); La Brande, alt. 700 ft., Aug. 14, 1905, *Nash & Taylor 1633* (NY).

PORTO RICO: Salinas de Cabo-Rojo, in sylvia litoralibus, Febr. 8, 1885, *Sintenis 273C* (US); in declivibus, Cabeza de San Juan, Sept. 14, 1885, *Sintenis 1891* (US); climbing over bushes in thicket, sandy shore, Playa de Esperanza, Vieques Island, Febr. 7, 1914, *Shafer 2757* (NY, US); sandy plain, Icacos Cay, Jan. 30, 1923, *Britton 7159* (NY).

VIRGIN ISLANDS: ST. THOMAS: rocky point, Cowell Point, Jan. 31-Febr. 4, 1913, *Britton Britton & Shafer 91* (NY, US); ST. CROIX: Grenard, Nov. 14, 1925, *Thompson 1005* (NY).

LEEWARD ISLANDS: TORTOLA: coastal thicket, Fish Bay to Road Town, Febr. 13-17, 1913, *Britton & Shafer 911* (NY, US); ANEGADA: sandy plain, West End, Febr. 19-20, 1913, *Britton & Fishlock 946* (NY, US); ST. MARTIN: March 28, 1926, *Goodwin & Goodwin 4* (NY); ANGUILLA, April 6, 1926, *Goodwin & Goodwin 16* (NY); ST. CHRISTOPHER: gulch, Canada Estate, Sept. 8-Oct. 5, 1901, *Britton & Cowell 365* (NY).

Also reported from the vicinity of Santa Marta, Colombia, by Purdie. This species is very unstable, even in such an important character as the linear appendages of the anther tips, which may occasionally be totally lacking, or extremely short. This is apparently the most frequently collected of the American Echitoideae, and space permits only the greatly abridged representation cited above. Although segregation may appear an attractive solution of the vexatious variability, a wide selection of specimens, such as that which has been available for these studies, should prove an effective deterrent.

**2. *Urechites Andrieuxii* Muell.-Arg.** *Linnaea* 30: 442. 1860; *Miers, Apoc. So. Am.* 125. 1878.

Stems relatively stout, minutely hirtellous when young,

eventually becoming glabrate; leaves opposite, petiolate, oblong- to ovate- or obovate-elliptic, apex rather shortly acuminate, base obtuse to rounded, 5-12 cm. long, 2.5-7.0 cm. broad, membranaceous to subcoriaceous, glabrous above, glabrous to very finely puberulent beneath; petioles 0.8-2.0 cm. long; inflorescence lateral, alternate, the peduncle usually somewhat surpassing the subtending leaves, bearing few to numerous handsome, yellow or cream colored flowers, glabrous to very inconspicuously puberulent; pedicels 1.5-2.2 cm. long, glabrous or essentially so; bracts minute, scarious, caducous; corolla infundibuliform, glabrous without, the proper-tube 1.0-1.5 cm. long, about 0.3 cm. in diameter at the base, slightly constricted toward the insertion of the stamens, the throat broadly tubular to subtubular, 2.5-3.0 cm. long, 0.5-0.8 cm. in diameter at the orifice, the lobes obliquely obovate, 1.5-2.3 cm. long, spreading; stamens inserted at the base of the corolla-throat, the anthers 0.6-0.7 cm. long, essentially glabrous to very minutely puberulent-papillate dorsally, the apical appendages linear, 0.7-0.9 cm. long; ovary ovoid, 0.15 cm. long, glabrous; nectaries concrescent, about twice surpassing the ovary; stigma 0.2 cm. long; calyx-lobes ovate, obtuse, 0.4-0.5 cm. long, glabrous or very indefinitely papillate, the squamellae in alternate pairs; follicles relatively stout, acuminate, falcate, continuous, 15-28 cm. long, glabrous; seeds 1.5-1.8 cm. long (including the rostrum), the pale tawny coma 2.5-3.5 cm. long.

MEXICO: CAMPECHE: over trees overhanging river, Champoton, July 7-15, 1932, *Steere 1918* (MBG); Tuxtepec, Dec. 3, 1931, *Lundell 842* (MBG).

BRITISH HONDURAS: occupied clearing, Belize, June, 1933, *Lundell 4056* (MBG); Jones Bank, March, 1933, *Lundell 4046* (MBG); San Andres, Corozal, July 11, 1933, *Lundell 4756* (MBG); Santa Rita, Oct., 1933, *Gentle 800* (MBG); Northern River, Dec., 1933, *Gentle 1037* (MBG); Honey Camp, Orange Walk, Nov., 1928, *Lundell LP33* (US); small climber growing in mangrove swamp, Stann Creek, Dec. 8, 1929, *Schipp 491* (MBG).

GUATEMALA: PETEN: La Libertad, May 31, 1933, *Lundell 3533* (MBG); Monte Polol, May 28, 1933, *Lundell 3445* (MBG); El Paso, common vine in low places, April 24, 1932, *Lundell 1524* (MBG); Santa Cruz, March 27-28, 1931, *Bartlett 12366* (MBG); ZACAPA: Gualan, alt. 620 ft., June 16, 1909, *Deam 6320* (MBG, NY).

The seminal rostrum of this species is much longer than that of *U. lutea*, and the placental chaff is less delicate, more defi-

nitely scaphiform, and with much less tendency to scale from the placenta upon dehiscence of the follicles.

#### EXCLUDED SPECIES

*Urechites Karwinski* Muell.-Arg. *Linnaea* 30: 440. 1860 = *Fernaldia pandurata* (A. DC.) Woodson, *Ann. Mo. Bot. Gard.* 19: 48. 1932 (*Echites pandurata* A. DC. in DC. *Prodr.* 8: 458. 1844).

#### XVII. RHABDADENIA Muell.-Arg.

*Rhabdadenia* Muell.-Arg. in *Mart. Fl. Bras.* 6<sup>1</sup>: 173. 1860; Miers, *Apoc. So. Am.* 118. 1878; K. Sch. in *Engl. & Prantl, Nat. Pflanzenfam.* 4<sup>2</sup>: 170. 1895.

Lactescent, suffruticose or suffrutescent lianas. Stems voluble or rarely suberect, terete; branches usually opposite below, becoming alternate above. Leaves opposite, petiolate to subsessile, the blade coriaceous to membranaceous, entire, penninerved, eglandular; petioles somewhat girdling at the node into a rather inconspicuous, minutely appendiculate, stipular ring. Inflorescence a lateral or subterminal, alternate, greatly reduced, dichasial cyme, frequently uniflorous. Flowers pedicellate, subtended by a solitary bract. Corolla infundibuliform, the proper-tube straight, narrowly cylindrical, the throat conical or tubular, the limb actinomorphic, 5-parted, dextrorsely convolute, widely spreading. Calyx 5-parted, the lobes equal or subequal, cleft nearly to the receptacle, subglandular within; stamens 5, epipetalous, the anthers coherent, consisting of 2 longitudinal, apically convergent, bilocular sporangia borne ventrally near the apex of an enlarged, sagittate, acutely biauriculate, dorsally pilose connective, the filament subcylindrical, puberulent, the pollen granular. Carpels 2, sessile or subinferior, apocarpous, united at the apex by an elongate, stylar shaft surmounted by the fusiform, apically pilose stigma; ovules many, anatropous, borne upon an axile, binate placenta. Nectaries 5, separate or somewhat conerescent at the base. Follicles 2, apocarpous, terete, continuous, dehiscing along the ventral suture, containing



many dry, subscaaphiform, rostrate, apically comose seeds; embryo straight, typically dicotyledonous.

Type species: *Rhabdadenia Pohlii* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 174. 1860.

#### KEY TO THE SPECIES

- a. Corolla white, the throat conical, dilating continuously toward the orifice; leaves coriaceous or firmly chartaceous; plants of the Antilles, the Bahama Islands, southern Florida, and Central America, also locally in lowlands of northern South America.....1. *R. biflora*
- aa. Corolla pink to rose-colored, the throat tubular, not dilating toward the orifice or only slightly so; leaves membranaceous; species of South America.
  - b. Plants scatteringly pilose; calyx-lobes 0.2–0.4 cm. long, much shorter than the proper-tube of the corolla.....2. *R. macrostoma*
  - bb. Plants glabrous; calyx-lobes 0.8–1.25 cm. long, about equalling the length of the proper-tube of the corolla.....3. *R. Pohlii*

1. *Rhabdadenia biflora* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 175. 1860; Miers, Apoc. So. Am. 121. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 170. 1895.

*Echites biflora* Jacq. Enum. Pl. Carib. 13. 1760; L. Sp. Pl. ed. 2. 307. 1762; Jacq. Select. Stirp. Am. Hist. 1: 30; 2: pl. 21. 1763; A. DC. in DC. Prodr. 8: 450. 1844.

*Echites paludosa* Vahl, Eclog. 2: 19. 1798; A. DC. loc. cit. 467. 1844.

*Exothostemon paludosum* (Vahl) G. Don, Gen. Hist. 4: 83. 1838; Miers, loc. cit. 241. 1878.

*Echites Ehrenbergii* Schlecht. Linnaea 26: 666. 1853.

*Echites Billbergii* Beurl. Vet. Akad. Handl. Stockh. 137. 1854 (1856).

*Rhabdadenia Ehrenbergii* (Schlecht.) Muell.-Arg. Linnaea 30: 454. 1860.

*Rhabdadenia paludosa* (Vahl) Miers, Apoc. So. Am. 119. 1878.

*Rhabdadenia nervosa* Miers, loc. cit. 122. 1878.

*Rhabdadenia cordata* Miers, loc. cit. 1878.

*Rhabdadenia macrantha* Donn. Sm. Bot. Gaz. 40: 7. 1905.

Glabrous, suffruticose lianas; stems terete, relatively stout; leaves opposite, petiolate, the blade coriaceous or firmly chartaceous, broadly obovate-oblong to lanceolate, apex usually



rather abruptly mucronulate, base obtuse, either surface yellowish-green, the upper somewhat nitidulous, 5–12 cm. long, 1.5–5.0 cm. broad, the petiole 1–2 cm. long; inflorescence lateral or rarely subterminal, cymose, the peduncle equalling or somewhat surpassing the length of the subtending leaves, bearing 1–5 white flowers clustered at the apex; pedicels 1.0–1.25 cm. long, somewhat accrescent in fruit, the subtending bracts scarious, minute; calyx-lobes subfoliaceous, broadly ovate-oblong, mucronulate, 0.1–0.9 cm. long; corolla infundibuliform, the proper-tube narrowly cylindrical, 1.5–2.0 cm. long, about 0.2 cm. in diameter at the base, somewhat constricted toward the insertion of the stamens, the throat conical, 2.0–3.0 cm. long, about 1.5 cm. in diameter at the orifice, the lobes broadly obovate, 2.0–2.5 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers elliptic-oblong, densely pilose dorsally, 0.5 cm. long; ovary ovoid, 0.2 cm. long, rather gradually produced into the style, glabrous; nectaries depressed-quadrate, essentially separate, about half equalling the length of the ovary; stigma 0.2 cm. long; mature follicles unknown.

UNITED STATES: FLORIDA: exact locality lacking, 1842–49, *Bugel 114* (MBG, BM); in sandy soil at edge of bay near Brickell Hammock, Miami, Dade Co., March 4, 1930, *Moldenke 725* (MBG, NY); salt marshes, Fort Myers, July–Aug., 1900, *Hitchcock 202* (MBG); Miami, June, 1877, *Garber s.n.* (MBG).

CUBA: exact locality lacking, 1860–64, *Wright 2954* (MBG); SANTA CLARA: Cienfuegos, Rio Damuji, May 23, 1895, *Combs 78* (MBG); data incomplete, *Sagra s.n.* (V).

JAMAICA: Port Antonio, Dec. 31, 1890, *Hitchcock s.n.* (MBG); Port Morant, Dec. 20, 1890, *Hitchcock s.n.* (MBG); GRAND CAYMAN: Jan., 1891, *Hitchcock s.n.* (MBG).

HISPANIOLA: HAITI: Grande Caymite, Aug. 20, 1927, *Eyerdam 321* (MBG); SANTO DOMINGO: Prov. Barahona, July, 1910, *Fuertes 220* (MBG).

PORTO RICO: prope Bayamon, in paludosis, March 22, 1885, *Sintenis 935* (S); Playa de Carmelita, in fruticetis paludosis prope marem, April, 1883, *Eggers 336* (V).

MEXICO: CAMPECHE: over shrubs in Pantel Aguada, Champoton, July 7–15, 1932, *Steere 1937* (MBG); YUCATAN: Port Silam, 1895, *Gaumer 653* (MBG); lagoon shores, Las Bocas de Silam, May, 1916, *Gaumer 23535* (MBG).

BRITISH HONDURAS: Stann Creek, common climber in swampy places along the coast, April 15, 1929, *Schipp 148* (MBG); mangrove swamp, Belize, March 11, 1933, *Lundell 1813* (MBG); Pueblo Nuevo, New River, July 17, 1933, *Lundell 4792* (MBG).

PANAMA: COLON: Porto Bello, April, 1826, *Billberg 254* (S); CANAL ZONE: Chagres, Jan.-March, 1850, *Fendler 257* (MBG).

COLOMBIA: MAGDALENA: Santa Marta, 1898-1901, *Smith 1664* (MBG); BOLIVAR: region of Barranquilla, April, 1935, *Elias 1291* (MBG).

BRITISH GUIANA: Kabakaburi, Pomeroon District, Febr. 10-15, 1923, *Crus 3274* (MBG); upper Rupununi River, near Dadanawa, May 30, 1922, *Crus 1417* (MBG).

FRENCH GUIANA: Cayenne, 1859, *Sagot 387* (V).

DUTCH GUIANA: Paramaribo, date lacking, *Wulfschlägel 324* (V).

BRAZIL: PARA: Caripi, juxta Para, Aug., 1849, *Spruce s.n.* (Camb., V); in *maritimis inundatis* ad Colares, May, 1832, *Poeppig 2946* (V); MARANHÃO: on lowland, border of river, Maracassume River region, Sept. 9, 1932, *Krukoff 1886* (MBG, NY); data incomplete, *Gardner 6060* (Camb., V).

**2. *Rhabdadenia macrostoma* (Benth.) Muell.-Arg.** *Linnaea* 30: 435. 1860; Miers, *Apoc. So. Am.* 123. 1878; K. Sch. in *Engl. & Prantl, Nat. Pflanzenfam.* 4<sup>2</sup>: 170. 1895.

*Echites macrostoma* Benth. in *Hook. Jour. Bot.* 3: 248. 1841; A. DC. in *DC. Prodr.* 8: 453. 1844.

Suffrutescent or suffrutescent lianas; stems terete, scatteringly pilose when young, eventually becoming glabrate; leaves opposite, petiolate, the blade membranaceous, obovate-oblong to broadly oblong-elliptic, apex rather abruptly mucronate, base obtuse to rounded, 3-6 cm. long, 1.5-3.5 cm. broad, upper surface minutely bullate-puberulent to glabrate, lower surface sparsely pilose along the midrib and veins, the petiole 0.3-0.5 cm. long, finely pilose to glabrate; cymes lateral, the peduncle about twice surpassing the length of the subtending leaves, bearing two pink or rose-colored flowers at the apex; pedicels 0.3-0.5 cm. long, somewhat accrescent in fruit, the subtending bracts scarious, lanceolate, minute; calyx-lobes scarious, linear-lanceolate, 0.2-0.4 cm. long, minutely and sparsely pilose to glabrate; corolla infundibuliform, the proper-tube narrowly cylindrical, 0.75-1.0 cm. long, about 0.1 cm. in diameter at the base, the throat broadly tubular, 3.0-3.5 cm. long, about 1 cm. in diameter at the orifice, the lobes broadly obovate, 1.5 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers narrowly oblong-lanceolate, 0.4 cm. long, pilose above; ovary oblongoid, 0.1 cm. long, rather gradually produced into the style, glabrous; stigma 0.2 cm. long; nectaries oblongoid, essentially separate, somewhat shorter

than the ovary; follicles terete, relatively slender, glabrous, 9–12 cm. long, seeds unknown.

BRITISH GUIANA: data incomplete, *Schomburgk 329* (Camb., V).

DUTCH GUIANA: locality lacking, 1846, *Hostmann 494, 712* (S); Paramaribo, date lacking, *Wulfschlägel 326* (V).

BRAZIL: PARA: on varzea land, near Bocca do Paru, Aug. 28, 29, 1934, *Krukoff 5931* (NY); Parana do Ricardo, Aug. 28, 29, *Krukoff 5915* (NY).

PERU: LORETO: swampy thickets, Iquitos, alt. 100 m., Aug. 2–8, 1929, *Killip & Smith 26911* (MBG).

**3. *Rhabdadenia Pohl*** Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 174. pl. 52. 1860; Miers, Apoc. So. Am. 119. 1878: K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 170. 1895.

*Rhabdadenia Pohl* Muell.-Arg. var. *volubilis* Muell.-Arg. loc. cit. 1860.

*Rhabdadenia Pohl* Muell.-Arg. var. *suberecta* Muell.-Arg. loc. cit. 175. 1860.

*Rhabdadenia Pohl* Muell.-Arg. var. *latifolia* Muell.-Arg. loc. cit. 1860.

*Rhabdadenia latifolia* (Muell.-Arg.) Malme, Arkiv f. Bot. 21A<sup>o</sup>: 17. 1927.

*Rhabdadenia latifolia* (Muell.-Arg.) Malme var. *suberecta* (Muell.-Arg.) Malme, loc. cit. 18. 1927.

*Rhabdadenia mamorensis* Rusby, Mem. N. Y. Bot. Gard. 7: 326. 1927.

Glabrous, suffruticose or suffrutescent lianas, occasionally erect or suberect; stems relatively slender; leaves petiolate to subsessile, the blade membranaceous, oblong-elliptic to linear, apex rather gradually acuminate, mucronulate, base narrowing from about the middle, obscurely auriculate, 5–12 cm. long, 0.75–3.0 cm. broad, either surface glabrous, the lower glaucescent, the petiole 0.25–1.0 cm. long, or essentially obsolete; cymes lateral to subterminal, the peduncle usually about twice surpassing the length of the subtending leaves, bearing 1–3 pink or rose-colored flowers at the apex; pedicels 0.5–1.0 cm. long, the subtending bracts filiform, minute; calyx-lobes narrowly oblong-lanceolate, minutely mucronulate, 0.8–1.25 cm. long; corolla infundibuliform, the proper-tube narrowly cylindrical, 0.75–1.0 cm. long, about 0.1 cm. in diameter at the base,

the throat rather broadly tubular, 2.5–3.5 cm. long, about 1 cm. in diameter at the orifice, the lobes broadly obovate, 1.5–2.0 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers narrowly lanceolate, 1.0–1.25 cm. long, sparsely pilosulose at the tip; ovary ovoid, 0.1 cm. long, rather gradually produced into the style, glabrous; stigma 0.4 cm. long; nectaries ovoid-oblongoid, separate, about equalling the length of the ovary; follicles unknown.

COLOMBIA: BOLIVAR: river marsh, Magangue, alt. 40–45 m., Jan. 18–19, 1918, Pennell 3956 (MBG).

VENEZUELA: Sacupana, lower Orinoco, April, 1896, Rusby & Squires 20 (MBG).

BRAZIL: PARANA: Piraquara, in paludosis, Jan. 7, 1909, Dusén 7781 (MBG); exact locality lacking, Nov., 1916, Brito 43 (US); RIO GRANDE DO SUL: Neu Württemberg, Estancia Coromel, Belisiano bei Lagão, Febr. 27, 1906, Bornmüller 693 (M); same locality, Jan. 16, 1905, Bornmüller 427 (M).

PARAGUAY: swamps, exact locality lacking, Dec. 8, 1928, Jørgensen 3450 (MBG); in esteros, Fraye, Jan. 5, 1929, Jørgensen 4038 (MBG).

ARGENTINA: MISSIONES: San Ignacio, Jan., 1918, Hauman 3591 (MBG).

This species varies greatly in its habit. Although always more or less twining in the northern portion of its range, it inclines strongly to the erect posture of such species as *Mandevilla erecta* (Vell.) Woodson. Perhaps such close relatives of normally twining congeners merit varietal or formal recognition, but our present evidence does not appear to warrant it.

#### EXCLUDED OR UNCERTAIN SPECIES

*Rhabdadenia barbata* (Desv.) Miers, Apoc. So. Am. 123. 1878 (*Echites barbata* Desv. ex Ham. Prodr. 30. 1825) = *Urechites lutea* (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Rhabdadenia Berterii* (A. DC.) Muell.-Arg. Linnaea 30: 446. 1860 (*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844) = *Angadenia Berterii* (A. DC.) Miers, Apoc. So. Am. 180. 1878.

*Rhabdadenia campestris* (Vell.) Miers, Apoc. So. Am. 121. 1878 (*Echites campestris* Vell. Fl. Flum. 113. 1830; Icon. 3: pl. 43. 1827) = *Mandevilla hirsuta* (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Rhabdadenia corallicola* Small, Bull. N. Y. Bot. Gard. 3: 434. 1905 = **Angadenia Berterii** (A. DC.) Miers, Apoc. So. Am. 180. 1878 (*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844).

*Rhabdadenia cubensis* Muell.-Arg. Linnaea 30: 435. 1860 = **Angadenia Berterii** (A. DC.) Miers, Apoc. So. Am. 180. 1878 (*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844).

*Rhabdadenia laxiflora* Miers, Apoc. So. Am. 120. 1878 = **Urechites lutea** (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Rhabdadenia Lindeniana* Muell.-Arg. Linnaea 30: 437. 1860 = **Angadenia Lindeniana** (Muell.-Arg.) Miers, Apoc. So. Am. 180. 1878.

*Rhabdadenia madida* (Vell.) Miers, Apoc. So. Am. 121. 1878 (*Echites madida* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 42. 1827). Probably referable to a species of *Mandevilla*, such as *M. scabra* (R. & S.) K. Sch., in which the inflorescence is frequently reduced to few flowers.

*Rhabdadenia polyneura* Urb. Symb. Ant. 7: 337. 1912 = **Odontadenia polyneura** (Urb.) Woodson, Ann. Mo. Bot. Gard. 18: 546. 1931.

*Rhabdadenia Sagraei* (A. DC.) Muell.-Arg. Linnaea 30: 435. 1860 (*Echites Sagraei* A. DC. in DC. Prodr. 8: 450. 1844) = **Angadenia Berterii** (A. DC.) Miers, Apoc. So. Am. 180. 1878 (*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844).

*Rhabdadenia Wrightiana* Muell.-Arg. Linnaea 30: 438. 1860 = **Neobraccia Valenzuelana** (A. Rich.) Urb. Symb. Ant. 9: 241. 1924 (*Echites Valenzuelana* A. Rich. in Sagra, Hist. Cuba 11: 93. 1850).

#### XVIII. ELYTROPUS Muell.-Arg.

**Elytropus** Muell.-Arg. Bot. Zeit. 18: 21. 1860; Benth. & Hook. Gen. Pl. 2: 728. 1876; Miers, Apoc. So. Am. 114. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 169. 1895.

Lactescent, suffruticose lianas. Stems terete, volubile, said to be suberect in some instances; branches alternate above, chiefly opposite below. Leaves opposite, shortly petiolate, pen-



ninerved, eglandular, the petioles subtended by 1-few inconspicuous, dentiform, adaxial stipular appendages. Inflorescence lateral, opposite, or infrequently alternate, determinate, 1-3-flowered, conspicuously bracteate. Calyx 5-parted, the lobes equal to sub-equal, cleft nearly to the receptacle, imbricated, eglandular. Corolla campanulate, the tube broad, ex-appendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel sporangia borne ventrally near the apex of an enlarged, narrowly sagittate connective; filaments separate; pollen granular. Carpels 2, united at the apex by a common stylar shaft surmounted by the capitate-fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or essentially so. Follicles 2, apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, truncate, apically comose seeds.

Type species: *Elytropus chilensis* (A. DC.) Muell.-Arg. Linnaea 30: 440. 1860.

1. *Elytropus chilensis* (A. DC.) Muell.-Arg. Linnaea 30: 440. 1860. Miers, Apoc. So. Am. 115. 1878.

*Echites pubescens* Hook. & Arn. Bot. Beechey Voy. 34. 1841, not Willd.

*Echites Chilensis* A. DC. in DC. Prodr. 8: 468. 1844.

*Echites ptarmica* Poepp. Nov. Gen. 3: 69. pl. 278. 1845.

*Echites heterophylla* Miq. Linnaea 25: 653. 1852, not Gmel.

*Elytropus pubescens* (Hook. & Arn.) Miers, loc. cit. 114. 1878.

*Elytropus ptarmicus* (Poepp.) Miers, loc. cit. 115. 1878.

*Vinca sternutatoria* Poepp. ex Miers, loc. cit. 1878, nom. nud. in synon.

*Elytropus heterophyllus* (Miq.) Miers, loc. cit. 116. 1878.

Stems usually relatively stout, densely ferruginous-puberulent to glabrate; leaves opposite, shortly petiolate, ovate to oblong-elliptic, apex rather shortly acuminate, base obtuse to



rounded, 3.5–9.0 cm. long, 1.2–4.5 cm. broad, subcoriaceous, above glabrous, nitidulous, beneath opaque, persistently ferruginous-puberulent; petioles 0.5–1.0 cm long, ferruginous-puberulent; inflorescence lateral, opposite, or infrequently alternate by the abortion of an opposite bud, much surpassed by the subtending leaves, 1–3-flowered; peduncle 0.3–0.7 cm. long, minutely puberulent to glabrate; bracts oblong-elliptic, 0.2–0.5 cm. long, somewhat foliaceous; pedicels 0.1–0.2 cm. long, minutely puberulent; calyx-lobes oblong-elliptic, acute, 0.55–0.8 cm. long, somewhat foliaceous, puberulent to pilosulose; corolla campanulate, glabrous without, the tube 0.5–0.9 cm. long, about 0.15–0.2 cm. in diameter at the base, 0.4–0.55 cm. in diameter at the orifice, the lobes obliquely ovate, shortly apiculate, 0.5–1.3 cm. long, spreading; stamens inserted near the base of the corolla-tube, the anthers barely included, oblong-sagittate, 0.5 cm. long, tips pilose; ovary ovoid, 0.07 cm. long, glabrous; stigma 0.15 cm. long; nectaries essentially separate, truncate, about equalling the ovary; follicles relatively stout, rather obscurely articulated, 15–20 cm. long, rather densely ferruginous-hirtellous; seeds 0.8–1.1 cm. long, the pale yellowish coma 3.0–3.5 cm. long.

CHILE: CHILOE: am Büschen schlingend, Piruquina, Oct. 22, 1931, *Gunckel 65* (MBG); data incomplete, Nov., 1925, *Joseph 3334* (US); LLANQUIHUE: Casa Panque, Dec., 1926, *Shannon & Shannon 28* (US); MALLECO: Cura Cautin, Nov., 1925, *Joseph 3397* (US); La Union, Oct. 25, 1931, *Behn 1179* (MBG); VALDIVIA: San Carlos, Oct. 5, 1931, *Gunckel 2361* (MBG); Loncoche, Sept., 1926, *Joseph 4408* (US); Panguipulli, Oct., 1923, *Joseph 2397* (US); Panguipulli, alt. 200 m., Oct., 1924, *Hollermayer 326* (MBG, NY, US); Ufergebüsch des Calle-Calle, Oct. 20, 1897, *Buchtien s.n.* (US); DATA INCOMPLETE: *Gay 384* (NY).

ARGENTINA: RIO NEGRO: Playa Bonita, region of Lago Nahuel Huapi, Nov. 1, 1928, *Cordoni s.n.* (MBG, US).

The relatively small cream-colored flowers are said to have a fragrance similar to that of Jasmine. Cordoni reports the flowers as violet or reddish.

#### EXCLUDED SPECIES

*Elytropus spectabilis* (Stadelm.) Miers, Apoc. So. Am. 116. 1878 (*Echites spectabilis* Stadelm. Flora 24<sup>1</sup>: Beibl. 44. 1841)

= *Macropharynx spectabilis* (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

### XIX. CYCLADENIA Benth.

*Cycladenia* Benth. Pl. Hartw. 322. 1849; Benth. & Hook. Gen. Pl. 2: 728. 1876; A. Gray, Syn. Fl. N. Am. ed. 1. 2<sup>1</sup>: 83. 1878; Miers, Apoc. So. Am. 263. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 168. 1895; Jepson, Man. Fl. Pl. Calif. 769. 1925.

Low, subsucculent, perennial herbs. Stems erect or more or less diffuse, terete; branches alternate or rather indefinitely clustered from the base. Leaves opposite, petiolate, the blade rather thick and subsucculent, entire, penninerved, eglandular; petioles winged and concrescent at the nodes, exappendiculate. Inflorescence rather irregularly dichasial, lateral or pseudoterminal, the pedicels subtended by solitary bracts. Flowers showy, reddish-violet or nearly cream-colored. Calyx 5-parted, the lobes subequal, imbricated, cleft nearly to the receptacle, eglandular. Corolla infundibuliform, the tube straight, greatly inflated at the insertion of the stamens into a conical throat, the limb 5-parted, actinomorphic, dextrorsely convolute. Stamens 5, inserted at the base of the corollathroat, wholly included; anthers connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged, sagittate, narrowly 2-auriculate connective; pollen granular; filament short, ligular, minutely pilose. Carpels 2, united at the apex by an elongate, stylar shaft surmounted by the subcapitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectary annular, completely concrescent. Follicles apocarpous or occasionally united at the tips, terete, relatively stout, falcate, dehiscing along the ventral suture, containing many dry, compressed, apically comose seeds; embryo straight, the cotyledons ovate, concave.

Type species: *Cycladenia humilis* Benth. Pl. Hartw. 322. 1849.

1. *Cycladenia humilis* Benth. Pl. Hartw. 322. 1849; A. Gray, Syn. Fl. N. Am. ed. 1. 2<sup>1</sup>: 83. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 168. 1895; Jepson, Man. Fl. Pl. Calif. 769. 1925.

Low, subsucculent, perennial herbs from a stout tap-root; stems 1-2 dm. tall; leaves opposite, petiolate, the blade rather thick, ovate to suborbicular, apex obtuse to rounded, base obtuse to obscurely cordate, rather gradually produced into the petiole, 3-7 cm. long, 2-6 cm. broad, greatly reduced below, the petiole 0.5-3.0 cm. long; cymes few- to several-flowered, about equalling or somewhat surpassing the subtending leaves; pedicels 0.75-1.25 cm. long, the subtending bracts narrowly lanceolate, 0.2-0.5 cm. long; calyx-lobes ovate-lanceolate to linear, acuminate, 0.5-0.75 cm. long; corolla showy, reddish-violet to cream-colored, the proper-tube 0.25-0.5 cm. long, about 0.2 cm. in diameter at the base, the throat conical, 0.5-0.75 cm. long, about 0.4-0.6 cm. in diameter at the orifice, the lobes obovate-oblong, 0.5-0.75 cm. long, spreading; anthers 0.35 cm. long, minutely papillate dorsally; ovary ovoid, rather abruptly produced into the style, about 0.15 cm. long; nectary annular, about half as high as the ovary; stigma subcapitate, 0.1 cm. long; follicles relatively stout, essentially continuous, falcate or slightly divaricate, 3.5-7.0 cm. long, about 0.3-0.5 cm. in diameter; seeds 0.75 cm. long, the pale tawny coma 1.5-2.0 cm. long.

**Var. typica.**

Plants glabrous and glaucous throughout.

UNITED STATES: CALIFORNIA: edge of lavas, Medicine Peak, Siskiyou Co., alt. 6000 ft., Aug. 5, 1893, *Baker s.n.* (UC); Sisson, Siskiyou Co., lower Canadian zone, July 16, 1902, *Setchell & Dobie s.n.* (UC); Snow Mt., Lake Co., alt. 7800 ft., Aug., 1894, *Purpus 851* (UC); Cobb Mt., Lake Co., July, 1893, *Leithold s.n.* (UC, LS); high slopes, Greenville and Lassen Lake, Plumas Co., July, 1872, *Lemmon 119* (UC); Lassen's Peak, Lassen Co., Aug., 1896, *Austin s.n.* (MBG); Sierra Co., 1875, *Lemmon 187* (MBG); peaks of Plumas Co., June, year lacking, *Lemmon s.n.* (MBG, UC); Greenville, Plumas Co., June 4, 1920, *Clemens s.n.* (CA); Mt. Lassen, Lassen Co., July 10, 1923, *Bassett s.n.* (CA); Lassen Volcanic Park, Lassen Co., June, 1927, *Sutcliffe s.n.* (CA); southeast side of Snow Mt. above Bonnie View, Lake Co., June 7, 1919, *Heller 13229* (CA, LS, MBG); Cedar Glen, Sierra Co., May 25, 1920, *V. Jones s.n.* (CA); Prospect Peak, 1929, *Kramer s.n.* (CA); Cobb Mt., near top,

alt. 4000 ft., May 31, 1927, *Baker 2180A* (LS); Lassen's Peak, Lassen Co., alt. 6000 ft., July 8, 1897, *M. E. Jones s.n.* (LS, PC); mesa near Black Butte, Siskiyou Co., Aug. 9, 1899, *Dudley s.n.* (LS); Silver Lake, Lassen Co., July 30, 1894, *Baker s.n.* (LS, UC); top of ridge west of Camp, Sta. Lucia Mts., Aug. 11, 1903, *Dudley s.n.* (LS); Indian Valley, June 2, 1873, *Lemmon s.n.* (LS); Mt. Balley, Shasta Co., Sept. 26-28, 1862, *Brewer 1448* (UC); Dutch Hill, Butte Co., 1879, *Austin 370* (UC); Doe Mill, Butte Co., May, 1893, *Austin & Bruce 2422* (PC); data incomplete, *Hartweg s.n.* (Camb.).

**Var. *venusta*** (Eastw.) Woodson, in Munz, Man. So. Calif. Bot. 379. 1935.

*Cycladenia venusta* Eastw. Bull. Torrey Bot. Club 29: 77. 1902.

Calyx and corolla-tube conspicuously pilose; in all other essential characters similar to the typical variety.

UNITED STATES: CALIFORNIA: Summit, San Antonio Mt., Los Angeles Co., June, 1899, *Hall s.n.* (LS); same locality, alt. 3170 m., June, 1897, *Hasse s.n.* (LS); Mt. San Antonio, San Bernardino Co., July, 1901, *Abrams 1920* (LS, PC); south slope of Baldy, San Antonio Mts., dry ground under pines, alt. 7500 ft., July 4, 1917, *Johnston 1428* (LS, UC, PC); Cucamonga Peak, San Antonio Mts., sunny exposure, well-packed granitic soil, alt. 8200 ft., July 31, 1917, *Johnston 1550* (LS, UC, PC); Devil's Backbone, San Antonio Mts., dry rocky ground, alt. 9000 ft., July 4, 1917, *Johnston 1431* (LS, UC, PC); dry soil on Mt. San Antonio, alt. 8000 ft., July 16, 1893, *McClatchie s.n.* (LS); upper San Antonio Canyon, San Bernardino Co., July 8, 1926, *M. E. Jones s.n.* (LS); Santa Lucia Mts., date lacking, *Abbott s.n.* (CA); Santa Lucia Peak, Oct. 3, 1921, *Clemens s.n.* (CA); Santa Lucia Mts., June 9, 1893, *Eastwood s.n.* (UC); southern slope of Mt. San Antonio, San Gabriel Mts., Los Angeles Co., on open talus slopes, alt. 10,000 ft., July 28-30, 1930, *Goodman & Hitchcock 1720* (MBG); gravelly ridges near summit, San Antonio Mt., alt. 9500 ft., June, 1899, *Hall 1231* (UC); San Antonio Mt., alt. 8000 ft., Aug. 20, 1905, *Wilder 591* (UC); ridge east of Ontario Peak, San Gabriel Mts., occasional on dry ridge, alt. 8300 ft., July 18, 1922, *Muns 6094* (PC); UTAH: San Rafael Swell, May 19, 1914, *M. E. Jones s.n.* (MBG, LS).

**Var. *tomentosa*** A. Gray, Syn. Fl. N. Am. ed. 2. 2<sup>1</sup>: 400. 1886.

*Cycladenia tomentosa* A. Gray, in Bot. Calif. Geol. Surv. 1: 474. 1876.

*Cycladenia humilis* Benth. var. *tomentosa* Jepson, Man. Fl. Pl. Calif. 769. 1925, in err.

Plants densely tomentose throughout; in all other essential characters similar to the typical variety with which it is occasionally found.

UNITED STATES: CALIFORNIA: Cedar Glen, Sierra Co., May 25, 1920, *V. Jones s.n.* (CA); Mt. Dyer, 1883, *Austin s.n.* (CA); Mt. Shasta, June, 1887, *Brandegee s.n.*

(MBG); Black Cone, near Shasta, date lacking, *Lemmon s.n.* (MBG, G, TYPE, UC, LS); Dutch Hill, Butte Co., 1879, *Austin 376* (UC); between Sisson's and Edgewood, Siakiyou Co., July, 1887, *Brandegge s.n.* (UC); trail between Indian Valley and Mountain Meadows, July, 1872, *Lemmon s.n.* (UC); mesa, near Black Butte, Siakiyou Co., Aug. 9, 1899, *Dudley s.n.* (LS).

Although its relatively isolated geographical distribution might appear to argue its specificity, *C. venusta* Eastw. has been reduced to varietal rank since it has no distinctive characteristic except its relatively restricted indument.

## XX. ECHITES P. Br.

*Echites* P. Br. Hist. Jam. 2: 182. 1756; Jacq. Enum. Pl. Carib. 13. 1760, in part; Select. Stirp. Am. Hist. 1: 30. 1763; L. Sp. Pl. ed. 2. 307. 1762; Gen. Pl. ed. 6. 117. 1764; A. DC. in DC. Prodr. 8: 446. 1844; Miers, Apoc. So. Am. 191. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 165. 1895, all in part, as to *E. umbellata* Jacq.

Lactescent, suffruticose or suffrutescent lianas. Stems voluble, terete; branches usually opposite below, becoming alternate above. Leaves opposite, petiolate, entire, penninerved, eglandular; petioles somewhat girdling at the node into an inconspicuous, minutely appendiculate, stipular ring. Inflorescence lateral, or rarely subterminal or terminal, alternate, a more or less modified dichasium, bracteate, bearing solitary to numerous flowers. Calyx 5-parted, the lobes equal or subequal, cleft nearly to the receptacle, bearing within at the base a solitary, frequently deeply dissected, opposite squamella. Corolla salverform, the tube straight, exappendiculate, not annulate, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers wholly included, connivent and agglutinated to the stigma, consisting of 2 parallel sporangia with a conspicuous, protuberant base borne ventrally near the apex of an enlarged, sagittate, narrowly 2-auriculate connective; pollen granular. Carpels 2, apocarpous, united at the apex by an elongate, stylar shaft surmounted by the fusiform-subcapitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or more



or less conerescent. Follicles 2, apocarpous, terete, continuous or only slightly articulated, dehiscing along the ventral suture, containing many dry, rostrate, apically comose seeds.

Type species: *Echites umbellata* Jacq. Enum. Pl. Carib. 13. 1760.

#### KEY TO THE SUBGENERA AND SECTIONS

- A. Corolla 1.25–2.5 cm. long, the lobes narrowly oblong- to elliptic-lanceolate, reflexed at anthesis; inflorescence relatively lax and many-flowered.... Subgen. I. PSEUDECHITES
- AA. Corolla 5–8 cm. long, the lobes obliquely obovate, spreading at anthesis; inflorescence relatively compact, few- to several-flowered.... Subgen. II. EUECHITES
- B. Corolla-tube not spirally contorted; species of Central America..... Sect. 1. YUCATANENSES
- BB. Corolla-tube spirally contorted; plants of southern peninsular Florida, the Bahama Islands, the Antilles, and locally of the peninsula of Yucatan and Atlantic coastal Colombia..... Sect. 2. UMBELLATAE

#### Subgen. I. PSEUDECHITES Woodson, subgen. nov.

Corolla 1.25–2.5 cm. long, the lobes narrowly oblong- to elliptic-lanceolate, long-acuminate, reflexed at anthesis; inflorescence relatively lax and several- to many-flowered. *Spp.* 1–2.

#### KEY TO THE SPECIES

- a. Corolla 1.25–1.8 cm. long, the lobes somewhat shorter than the tube; ovary and nectaries glabrous.....1. *E. tuxtlensis*
- aa. Corolla 2.0–2.5 cm. long, the lobes about twice surpassing the tube; ovary puberulent-papillate, nectaries minutely pilosulose-barbate....2. *E. turbinata*

1. *Echites tuxtlensis* Standl. Contr. U. S. Nat. Herb. 23: 1164. 1924.

Stems relatively slender, glabrous; leaves opposite, shortly petiolate, narrowly lanceolate- to obovate-elliptic, apex acuminate, base cuneate, 6–10 cm. long, 1.5–3.5 cm. broad, firmly membranaceous to subcoriaceous, glabrous; petioles 0.3–0.8 cm. long; inflorescence lateral, alternate, a lax, dichotomous, bostrychoid dichasium bearing several to many small, yellowish-green flowers, much surpassing the subtending leaves, wholly glabrous; pedicels 0.7–1.0 cm. long; bracts minutely trigonal, about 0.1 cm. long, or somewhat less; calyx-lobes ovate-trigonal, acute to acuminate, 0.1–0.15 cm. long, glabrous, the squamellae deltoid, minutely erose; corolla salverform,



glabrous without, the tube 0.8–1.0 cm. long, about 0.1 cm. in diameter at the base, slightly dilating somewhat above the base at the insertion of the stamens, thence slightly constricting toward the orifice, the lobes oblong- to elliptic-lanceolate, acuminate, somewhat shorter than the tube, more or less reflexed at anthesis; stamens inserted near the base of the corolla-tube, the anthers narrowly elliptic-sagittate, 0.55 cm. long, glabrous; ovary oblong-ovoid, about 0.1 cm. long, glabrous; stigma 0.1 cm. long; nectaries separate, about half equalling the ovary; follicles known.

MEXICO: CHIAPAS: near Tuxtla, alt. 2400–2800 ft., Sept. 1, 1895, *Nelson 3080* (US, TYPE, MBG, photograph and analytical drawings).

BRITISH HONDURAS: high ridge, Corozal District, 1931–32, *Gentle 439* (MBG); Maskall, Northern River, Dec., 1933, *Gentle 1022* (MBG).

COSTA RICA: Heredia, in Monte Barba, date lacking, *Ørsted 15544* (C).

**2. *Echites turbinata* Woodson, Ann. Mo. Bot. Gard. 21: 615. 1934.**

Stems relatively stout, glabrous; leaves opposite, petiolate, elliptic, apex acuminate, base broadly obtuse, 7.5–12.0 cm. long, 3.5–7.0 cm. broad, firmly membranaceous, evidently somewhat subsucculent, glabrous; petioles 0.8–1.3 cm. long; inflorescence lateral, alternate, rather irregularly dichasial, about equalling the subtending leaves, bearing several rather small, yellowish-green (?) flowers, glabrous throughout; pedicels 0.8–1.0 cm. long; bracts ovate-lanceolate, 0.13–0.3 cm. long; calyx-lobes ovate, acuminate, 0.3–0.32 cm. long, glabrous, the squamellae deltoid, minutely denticulate; corolla salverform, minutely puberulent-papillate without, the tube 0.7–0.8 cm. long, about 0.15 cm. in diameter at the base, slightly constricting toward the orifice, the lobes narrowly elliptic-lanceolate, acuminate, 1.4–1.6 cm. long, somewhat turbinate; stamens inserted about midway within the corolla-tube, the anthers rather narrowly trigonal-sagittate, 0.45 cm. long, glabrous; ovary ovoid, very minutely puberulent-papillate, about 0.15 cm. long; stigma 0.15 cm. long; nectaries separate, somewhat shorter than the ovary, minutely pilosulose-barbate at the tips; follicles unknown.

COSTA RICA: forests du Rancho Flores, Febr. 22, 1890, *Tonduz 2147* (B, TYPE, MBG, photograph and analytical drawings).

A drawing of the inflorescence of this species, with remarks on its structure, will be found in *Ann. Mo. Bot. Gard.* 22: 14. *pl. 2, fig. 2.* 1935.

Subgen. II. *EUECHITES* Woodson, subgen. nov.

Corolla 5-8 cm. long, the lobes obliquely obovate, obtuse to shortly acuminate, spreading at anthesis; inflorescence relatively compact, few- to several-flowered. *Sects. 1-2.*

Sect. 1. *YUCATANENSES* Woodson. Corolla relatively delicate in texture, the buds attenuate, the tube straight, not spirally contorted. Species of Central America. *Spp. 3-5.*

#### KEY TO THE SPECIES

- a. Inflorescence almost perfectly dichasial to simply helicoid, not subumbellate.....3. *E. turrigera*
- aa. Inflorescence subumbellate.
  - b. Leaves coriaceous or subcoriaceous, more or less pandurate, conspicuously nitidulous above with verrucose venation.....4. *E. yucatanensis*
  - bb. Leaves rather delicately membranaceous, evidently never pandurate, opaque above, the venation not verrucose.....5. *E. elegantula*

3. *Echites turrigera* Woodson, *Ann. Mo. Bot. Gard.* 19: 381. 1932.

*Echites cincinnalis* Woodson, loc. cit. 21: 616. 1934.

Stems relatively slender, rather inconspicuously pilosulose when young, eventually becoming glabrate; leaves opposite, petiolate, broadly oblong- to ovate- or obovate-elliptic, apex rather shortly acuminate, base obtuse to rounded, rarely obscurely cordate, 5-15 cm. long, 3-10 cm. broad, membranaceous, wholly glabrous, somewhat nitidulous and the venation somewhat verrucose above, rather pale yellowish-green; petioles 0.8-4.0 cm. long, glabrous; inflorescence lateral to subterminal, alternate, almost perfectly dichasial to simply helicoid, somewhat surpassing the subtending leaves, bearing 6-20 rather showy, white or cream-colored flowers; peduncle minutely pilosulose-scabridulous to glabrate; pedicels 1.0-1.2 cm. long, minutely pilosulose-scabridulous to nearly glabrate; bracts oblong-lanceolate, acuminate, somewhat foliaceous, 0.1-0.3 cm.

long; calyx-lobes lanceolate, acuminate, 0.3–0.7 cm. long, rather sparsely pilosulose, the squamellae erose to lacerate; corolla salverform, glabrous without, the tube 2.8–3.8 cm. long, about 0.15–0.2 cm. in diameter at the base, rather conspicuously and abruptly dilated somewhat below midway at the insertion of the stamens, thence rather gradually constricting toward the orifice, the lobes obliquely obovate, shortly acuminate, 1.5–2.0 cm. long, spreading; anthers rather narrowly oblong-sagittate, 0.75–0.8 cm. long, glabrous; ovary oblongoid, about 0.15–0.2 cm. long, glabrous; stigma 0.15 cm. long; nectaries separate or rather indefinitely conerescent, somewhat less than half equaling the ovary; immature follicles rather sparsely pilosulose.

GUATEMALA: ZACAPA: Gualan, alt. 620 ft., June 20, 1909, *Deam 6376* (MBG, TYPE, NY); JUTIAPA: Laguna de Guija, alt. 1200 m., April, 1894, *Heyde & Lux 6345* (NY).

NICARAGUA: GRANADA: environs de Granada, alt. 40 m., autumn, 1869, *Lévy 1074* (C, MBG, photograph and analytical drawings); low hills near Granada, edge of thicket, July 2, 1923, *Maxon Harvey & Valentine 7614* (US).

When *E. cincinnalis* was originally described, only two of the specimens cited above were known to me, *Lévy 1074*, the type of *E. cincinnalis*, and *Deam 6376*, the type of *E. turrigera*. The former species was erected upon the basis of a simple, cincinnal inflorescence, that of *E. turrigera* being an almost perfect, compound dichasium. Geographical distribution was also a fancied support for the distinction of the species. However, with the examination of *Heyde & Lux 6345* and *Maxon Harvey & Valentine 7614*, it appears probable that the inflorescence of the collective species is much more variable than is usual, and it has been decided to consolidate the two former species, at least until additional evidence warranting their segregation is forthcoming.

4. *Echites yucatanensis* Millsp. ex Standl. Field Mus. Publ. Bot. 8: 35. 1930.

Stems relatively stout, glabrous; leaves opposite, ovate to oblong, frequently irregularly pandurate, apex acuminate, base obtuse to rounded, 7–12 cm. long, 2.5–7.0 cm. broad, coriaceous to subcoriaceous, dark green and nitidulous above, the venation

conspicuously verrucose, opaque beneath, glabrous throughout; petioles 1–2 cm. long; inflorescence lateral, alternate, subumbellate, bearing 3–9 greenish-yellow (?) flowers; peduncle glabrous, usually somewhat shorter than the subtending leaves; pedicels 1.0–1.3 cm. long, glabrous; bracts ovate-lanceolate, minute, scarious; calyx-lobes ovate-lanceolate, acuminate, 0.18–0.2 cm. long, glabrous, the squamellae deltoid, minutely erose; corolla salverform, glabrous without, the tube 4.0–4.5 cm. long, about 0.2 cm. in diameter at the base, somewhat below midway abruptly dilated at the insertion of the stamens, thence gradually constricting toward the orifice, the lobes obliquely obovate, shortly acuminate, 2.5–3.0 cm. long, spreading; anthers lanceolate-sagittate, 1.0–1.2 cm. long, glabrous; ovary oblongoid, about 0.15 cm. long, glabrous; stigma 0.2 cm. long; nectaries more or less concrescent at the base, less than half equalling the ovary; follicles relatively slender, acuminate, continuous, rigidly divaricate, 16–25 cm. long, glabrous; seeds 1.0–1.2 cm. long, the tawny coma 1.5–2.0 cm. long.

MEXICO: CAMPECHE: small vine, Tuxpeña, Febr. 18, 1932, *Lundell 1350* (MBG, NY, US); YUCATAN: Chichankanab, date lacking, *Gaumer 1979* (C, MBG, S, isotypes); in clearing, Chichen-Itza, June 22, 1932, *Steere 1471* (MBG); Xkantunil, date lacking, *Gaumer 817* (S); Izamal, date lacking, *Gaumer 817* (C).

**5. *Echites elegantula* Woodson, Am. Jour. Bot. 22: 686. 1935.**

Stems relatively slender, glabrous; leaves opposite, shortly petiolate, ovate-elliptic, apex acutely subcaudate-acuminate, base obtuse and somewhat decurrent, 5–8 cm. long, 2.0–3.5 cm. broad, rather delicately membranaceous, opaque, glabrous, the veins not verrucose above; petioles 0.5–1.0 cm. long; inflorescence lateral, alternate, subumbellate, bearing 4–8 showy, greenish cream-colored flowers; peduncle about half equalling the subtending leaves, essentially glabrous; pedicels 1.5–2.0 cm. long, glabrous; bracts linear, 0.2–0.3 cm. long; calyx-lobes lanceolate, acuminate, 0.3–0.5 cm. long, indistinctly papillate without, the squamellae subquadrate, essentially entire; corolla salverform, very minutely papillate without, the tube 5.0–5.5 cm. long, about 0.15 cm. in diameter at the base, some-

what below midway abruptly dilated at the insertion of the stamens, thence gradually constricting toward the orifice, the lobes obliquely obovate, obtuse, 3.0–3.5 cm. long, spreading; anthers elliptic-lanceolate, obtusely auriculate, 0.9 cm. long, glabrous; ovary oblongoid, about 0.3 cm. long, glabrous; stigma 0.3 cm. long; nectaries concrescent, somewhat less than half equalling the ovary; follicles unknown.

MEXICO: YUCATAN: over tree in forest, Chichen-Itza, June 23, 1932, Steere 1477 (MBG, TYPE).

The obtusely auricled anthers are an exception to the general rule of this genus.

Sect. 2. *UMBELLATAE* Woodson. Corolla relatively fleshy in texture, the buds obtuse, the tube spirally contorted. Plants of southern peninsular Florida, the Bahama Islands, the Antilles, and locally of the peninsula of Yucatan and Atlantic coastal Colombia. *Sp. 6.*

#### 6. *Echites umbellata* Jacq.

Stems relatively stout, glabrous; leaves opposite, shortly petiolate, narrowly oblong-elliptic to suborbicular, apex acuminate to rounded and somewhat retuse, base obtuse to rounded, occasionally somewhat cordate, firmly membranaceous or somewhat subsucculent, glabrous; inflorescence lateral to subterminal, alternate, irregularly dichasial to subumbellate, glabrous throughout; peduncle somewhat shorter than the subtending leaves, or virtually lacking, bearing relatively few greenish-yellow flowers; pedicels 1.0–1.5 cm. long, glabrous, greatly accrescent in fruit; bracts ovate to ovate-lanceolate, 0.15–0.3 cm. long, only slightly foliaceous; calyx-lobes ovate to narrowly oblong-trigonal, acute to acuminate, 0.15–0.5 cm. long, glabrous, scarious or only slightly foliaceous, the squamellae very deeply lacerate; corolla salverform, glabrous without, 2.0–5.5 cm. long, about 0.15–0.2 cm. in diameter at the base, somewhat dilated slightly below midway at the insertion of the stamens, thence gradually constricting toward the orifice, spirally contorted above the insertion of the stamens, the lobes



obliquely obovate, obtuse to very inconspicuously apiculate, 1.1–3.0 cm. long, spreading; stamens inserted slightly below midway within the corolla-tube, the anthers narrowly lanceolate-sagittate, 0.9–1.2 cm. long, glabrous; ovary oblongoid, about 0.15 cm. long, glabrous; stigma 0.2 cm. long; nectaries essentially separate, about equalling to about half equalling the ovary; follicles relatively stout, continuous, acuminate, rigidly divaricate, 9–26 cm. long, glabrous; seeds 0.5–0.85 cm. long, the tawny coma 1.5–5.0 cm. long.

**Var. typica.**

*Echites umbellata* Jacq. Enum. Pl. Carib. 13. 1760; Select. Stirp. Am. Hist. 1: 30; 2: pl. 22. 1763; A. DC. in DC. Prodr. 8: 447. 1844; Miers, Apoc. So. Am. 193. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 165. 1895.

*Tabernaemontana Echites* L. Syst. Pl. ed. 10. 945. 1759.

*Echites litorea* HBK. Nov. Gen. 3: 212. 1819; A. DC. loc. cit. 448. 1844; Miers, loc. cit. 199. 1878.

*Echites umbellata* Jacq. var. *longiflora* Griseb. Cat. Pl. Cub. 172. 1866.

*Echites ovata* P. Br. ex Miers, loc. cit. 192. 1878, in err.

*Echites obliqua* Miers, loc. cit. 193. 1878.

*Echites longiflora* (Griseb.) Miers, loc. cit. 194. 1878.

*Echites Echites* (L.) Britton, in Small, Fl. Miami, 147. 1913.

Leaves narrowly oblong-elliptic to suborbicular, 4–12 cm. long, 2.0–7.6 cm. broad; petioles 0.3–1.5 cm. long; inflorescence 2–7-flowered, the peduncle manifest, somewhat shorter than the subtending leaves.

UNITED STATES: FLORIDA: sandy field at Cape Sable, July, year lacking, *Curtiss 2266* (MBG, NY, US); climbing over bushes, Old Rhodes Key, July 2, 1895, *Curtiss 5448* (MBG, NY, US); Miami, May 7, 1904, *Tracy 9185* (MBG, NY); pinelands between Miami and Kendall Station, Nov. 5, 1906, *Small & Carter 2657* (NY); Key West, 1874, *Palmer 438* (MBG); on dunes, uncommon here, Palm Beach, June 7, 1896, *Webber 454* (MBG); pinelands, Big Pine Key, Febr. 27, 1911, *Small Carter & Small 3545* (NY); pinelands between Peter's Prairie and Homestead, Nov. 10, 1906, *Small & Carter 2655* (NY); pinelands about Cox Hammock, Dade Co., June



24, 1915, *Small Mosier & Small 6582* (NY); Snapper Creek, south of Coconut Grove, Oct. 27–31, 1901, *Small & Nash s.n.* (NY).

BAHAMA ISLANDS: The Bight and vicinity, Cat, March 1–6, 1907, *Britton & Millspough 5887* (NY); Governor's Harbor, Nov. 14, 1890, *Hitchcock 16* (MBG); Abraham Bay and vicinity, Mariguana, Dec. 6–8, 1907, *Wilson 7458* (NY); Eleuthera Bluff, Eleuthera, Jan. 10, 1932, *Fairchild s.n.* (US); Water Key, Salt Key Bank, May 22, 1909, *Wilson 8148* (MBG, NY); southeast end, Watling's, Nov. 27–28, 1907, *Wilson 7273* (NY); Grand Turk, Aug. 27–Sept. 1, 1905, *Nash & Taylor 3890* (NY); coppice, Green Turtle Cay, Abaco, Dec. 4, 1904, *Brace 1492* (NY); west end, Great Bahama, April 16–May 8, 1905, *Brace 3588* (NY); vicinity of Blue Hills, New Providence, May 28–29, 1909, *Wilson 8240* (NY); Mangrove Cay, Andros, Aug. 18–Sept. 10, 1906, *Brace 4897* (MBG); South Caicos, Dec. 14–16, 1907, *Wilson 7595* (MBG, NY); Gold Rock, Acklin's, Dec. 21, 1905–Jan. 6, 1906, *Brace 4399* (NY, US).

CUBA: PINAR DEL RIO: palm-barrens west of Guane, Nov. 21–22, 1911, *Shafer 10370* (MBG, NY, US); limestone hills, vicinity of Sumiduro, July 28–31, 1912, *Shafer 13419* (NY, US); ISLA DE PINOS: over bushes on river bank, near Nueva Gerona, July 8, 1900, *Palmer & Riley 1041* (US); HABANA: near Morro Castle, May 20, 1908, *Leon 713* (NY); climbing through bushes in swamp near the sea, Playa de Mariana, June 17, 1900, *Palmer & Riley 842* (US); MATANZAS: coral rock soil east of Matanzas, March 13, 1903, *Britton Britton & Shafer 176* (NY); Playa, Aug. 28, 1903, *Britton & Wilson 59* (NY); SANTA CLARA: Cienequita, May 9, 1895, *Combs 17* (MBG); dry field, vicinity of Sancti Spiritus, Febr. 15–24, 1912, *Shafer 12167* (NY); CAMAGUEY: Cayo Paloma, Oct. 12, 1909, *Shafer 2590* (MBG, NY, US); vicinity of La Gloria, Febr. 4, 1909, *Shafer 302* (NY, US); ORIENTE: Cave Hill, limestone hills, south of Holguin, April 11, 1909, *Shafer 1236* (NY, US); Punta Maisi, Dec. 14, 1910, *Shafer 7930* (NY).

JAMAICA: climbing over shrubs, Constant Spring to Bardowie, Febr. 8, 1915, *Harris 12109* (MBG, NY, US); in sand, coastal region east of Montego Bay, sea-level, March 28, 1920, *Maxon & Killip 1615* (US); Port Royal, Dec. 18, 1890, *Hitchcock s.n.* (MBG); Bog Walk, Dec. 17, 1890, *Hitchcock s.n.* (MBG).

HISPANIOLA: SANTO DOMINGO: Paradis, prope Barahona, in fruticetis litoralibus, Dec., 1909, *Tuerckheim 2689* (NY, US); southeast of town, San Pedro de Macoris, March 31, 1913, *Rose Fitch & Russell 4292* (NY, US); semi-arid pine region, Moncion, Prov. Monte Cristy, alt. 375 m., June 5, 1930, *Valeur 444* (MBG, US); Lajana, Samana Peninsula, alt. about 100 m., Apr. 30–May 2, 1922, *Abbott 2275* (US); HAITI: twining on shrubs, bluff east of Bord de Mer, vicinity of Jean Rabel, Jan. 27–Febr. 9, 1929, *Leonard & Leonard 12883* (NY, US); downs of cliff-bordered shore west of Cabaret, Baie des Moustiques, Jan. 13, 1929, *Leonard & Leonard 11923* (US); thickets on coral rocks east of La Tete Linne, vicinity of Basse Tierre, Tortue Island, March 24, 1929, *Leonard & Leonard 14070* (US); a common vine, Miragoane and vicinity, April 12, 1927, *Eyerdam 431* (US); hillside, Bayeux, near Port Margot, Aug. 4, 1903, *Nash 133* (NY, US).

MEXICO: YUCATAN: Isla Mujeres, March 24–26, 1901, *Goldman 646* (US); in clearing, Uxmal, July 20–21, 1932, *Steere 1987* (MBG).

BRITISH HONDURAS: coastal region, Honey Camp, Sept., 1929, *Lundell 515* (MBG, NY, US).

COLOMBIA: San Andres Island, June, 1929, *Toro 28* (NY).

Var. *crassipes* (A. Rich.) Gomez, Anal. Soc. Espan. Hist. Nat. 23: 274. 1894.

*Echites crassipes* A. Rich. in Sagra, Hist. Cuba 11: 91. 1850.

*Rhodocalyx crassipes* (A. Rich.) Miers, Apoc. So. Am. 140. 1878.

Leaves narrowly oblong-elliptic to nearly linear, 1-6 cm. long, 0.2-1.5 cm. broad; petioles 0.1-0.3 cm. long; peduncle obsolete or scarcely manifest, the solitary pedicels apparently sessile.

CUBA: HABANA: Cuabal de Jesus Maria, Minas, June 24, 1915, *Leon 5211* (NY); MATANZAS: serpentine hills near Cauasi, Oct. 10, 1927, *Leon 13138* (NY); SANTA CLARA: on bushes, Sagua, Sept. 4, 1903, *Britton & Wilson 327* (NY); CAMAGUEY: Santayana, in palm barrens in serpentine, Oct. 4, 1922, *Ekman 1533* (S); ORIENTE: Holguin, Cerro de Fraile, in fruticetis, Sept. 25, 1916, *Ekman 7549* (S); barren savannas, southeast of Holguin, rocky places, Nov. 26-29, 1909, *Shafer 2951* (NY).

These plants appear to be no more than microphyllous, depauperate individuals of var. *typica*, and it is doubtful whether they should even be recognized as a variety. The reduction of the primary peduncle is perhaps their greatest distinction.

#### EXCLUDED OR UNCERTAIN SPECIES

*Echites acuminata* R. & P. Fl. Peruv. 2: 19. pl. 134. 1799 = **Mesechites acuminata** (R. & P.) Muell.-Arg. Linnaea 30: 446. 1860.

*Echites acutiloba* A. DC. in DC. Prodr. 8: 451. 1844 = **Mandevilla acutiloba** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 54. 1932.

*Echites adglutinata* Jacq. Select. Stirp. Am. Hist. 1: 31; 2: pl. 23. 1763, err. typ. = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760 = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

*Echites albiflora* Miers, Apoc. So. Am. 204. 1878 = **Tabernaemontana** sp. The present taxonomic confusion of the genus

*Tabernaemontana* precludes a precise relegation of this synonym.

*Echites alexicaca* Mart. ex Stadelm. Flora 24<sup>1</sup>: Beibl. 68. 1841 = **Mandevilla illustris** (Vell.) Woodson var. **glabra** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 20: 729. 1933 (*Dipladenia illustris* (Vell.) Muell.-Arg.  $\beta$  **glabra** Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 125. pl. 38. 1860).

*Echites almadensis* Stadelm. Flora 24<sup>1</sup>: Beibl. 28. 1841 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792, not R. & P.).

*Echites altescandens* H. Winkl. in Fedde, Rep. Spec. Nov. 7: 243. 1909 = **Mandevilla antennacea** (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites antennacea* A. DC. in DC. Prodr. 8: 456. 1844).

*Echites amazonica* Stadelm. Flora 24<sup>1</sup>: Beibl. 50. 1841 = **Odontadenia verrucosa** (R. & S.) K. Sch. ex Mgf. in Pulle, Fl. Surinam 4: 53. 1932 (*Echites verrucosa* R. & S. Syst. 4: 795. 1819).

*Echites andina* (Muell.-Arg.) Miers, Apoc. So. Am. 204. 1878 (*Amblyanthera andina* Muell.-Arg. Linnaea 30: 425. 1860) = **Mandevilla riparia** (HBK.) Woodson, Ann. Mo. Bot. Gard. 19: 58. 1932 (*Echites riparia* HBK. Nov. Gen. 3: 214. 1819).

*Echites Andrewsii* Chapm. Fl. So. U. S. 359. 1860 = **Urechites lutea** (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites Andrieuxii* (Muell.-Arg.) Miers, Apoc. So. Am. 206. 1878 (*Amblyanthera Andrieuxii* Muell.-Arg. Linnaea 30: 422. 1860) = **Mandevilla Andrieuxii** (Muell.-Arg.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882.

*Echites angustifolia* Benth. in Hook. Jour. Bot. 3: 247. 1841, not Poir. = **Mandevilla Benthamii** (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites Benthamii* A. DC. in DC. Prodr. 8: 467. 1844).

*Echites angustifolia* Poir. Encycl. Suppl. 2: 537. 1812 = **Mesechites angustifolia** (Poir.) Miers, Apoc. So. Am. 230. 1878.

*Echites annularis* L. f. Suppl. 166. 1781 = **Prestonia annularis** (L. f.) G. Don, Gen. Hist. 4: 84. 1838.

*Echites antennacea* A. DC. in DC. Prodr. 8: 456. 1844 = **Mandevilla antennacea** (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites* (*Amblyanthera* ?) *apocynifolia* A. Gray, Proc. Am. Acad. 22: 435. 1887 = **Mandevilla apocynifolia** (A. Gray) Woodson, Ann. Mo. Bot. Gard. 19: 65. 1932.

*Echites arborea* Vell. Fl. Flum. 114. 1830; Icon. 3: pl. 47. 1827 = **Malouetia arborea** (Vell.) Miers, Apoc. So. Am. 89. 1878.

*Echites aspera* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 359. 1844. This may possibly refer to *Mandevilla subsagittata* (R. & P.) Woodson. The type specimen, *Galeotti 1587*, was unavailable during these studies although special search was made for it in the principle collections of Europe and America.

*Echites asperuginis* Sw. Prodr. 52. 1788 = **Anechites lapulacea** (Lam.) Miers, Apoc. So. Am. 237. 1878 (*Echites lapulacea* Lam. Encycl. 2: 341. 1786).

*Echites assimilis* K. Sch. in Engl. Bot. Jahrb. 25: 724. 1898 = **Mandevilla riparia** (HBK.) Woodson, Ann. Mo. Bot. Gard. 19: 58. 1932 (*Echites riparia* HBK. Nov. Gen. 3: 214. 1819).

*Echites atropurpurea* Lindl. in Paxt. Mag. Bot. 9: 199. 1842 = **Mandevilla atrovioleacea** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 20: 724. 1933 (*Echites atrovioleacea* Stadelm. Flora 24<sup>1</sup>: Beibl. 75. 1841).

*Echites atrovioleacea* Stadelm. Flora 24<sup>1</sup>: Beibl. 75. 1841 = **Mandevilla atrovioleacea** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 20: 724. 1933.

*Echites augusta* Vell. Fl. Flum. 114. 1830; Icon. 3: pl. 48. 1827 = **Macrosiphonia longiflora** (Desf.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 140. pl. 43. 1860 (*Echites longiflora* Desf. Mem. Mus. Paris 5: 177. pl. 20. 1819).

*Echites auriculata* Pohl ex Stadelm. Flora 24<sup>1</sup>: Beibl. 25. 1841 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites axillaris* Sesse & Moc. Fl. Mex. 45. 1887. Description impossible to interpret.

*Echites Bangii* Rusby, Bull. N. Y. Bot. Gard. 4: 409. 1907 = *Prestonia acutifolia* (Benth.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895 (*Haemadictyon acutifolium* Benth. ex Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 167. 1860).

*Echites barbata* Desv. in Ham. Prodr. 30. 1788 = *Urechites lutea* (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites barbata* Sesse & Moc. Fl. Mex. 45. 1887, non Desv. Description impossible to interpret.

*Echites Benthami* A. DC. in DC. Prodr. 8: 467. 1844 = *Mandevilla Benthami* (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844 = *Angadenia Berterii* (A. DC.) Miers, Apoc. So. Am. 180. 1878.

*Echites bicolor* Miq. Stirp. Surinam. Select. 154. 1851 = *Mandevilla scabra* (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites bicorniculata* Rusby, Descr. So. Am. Pl. 86. 1920 = *Mesechites bicorniculata* (Rusby) Woodson, Ann. Mo. Bot. Gard. 19: 387. 1932.

*Echites bicornis* Spruce, ex Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 114. 1860, nom. nud. in synonym. = *Odontadenia verrucosa* (R. & S.) K. Sch. ex Mg. in Pulle, Fl. Surinam 4: 53. 1932 (*Echites verrucosa* R. & S. Syst. 4: 795. 1819).

*Echites biflora* Jacq. Enum. Pl. Carib. 13. 1760 = *Rhabdadenia biflora* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 175. 1860.

*Echites bignoniaeflora* Schlecht. Linnaea 26: 372. 1853 = *Stemmadenia Galeottiana* (A. Rich.) Miers, Apoc. So. Am. 76. 1878 (*Odontostigma Galeottianum* A. Rich. in Sagra, Hist. Cuba 11: 87. pl. 56. 1850).

*Echites Billbergii* Beurl. Vet. Akad. Handl. Stockh. 137. 1854 (1856) = *Rhabdadenia biflora* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 175. 1860 (*Echites biflora* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites Blanchetii* A. DC. in DC. Prodr. 8: 448. 1844 =



**Prestonia coalita** (Vell.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites coalita* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 40. 1827).

*Echites bogotensis* HBK. Nov. Gen. 3: 215. pl. 243. 1819 = **Mandevilla bogotensis** (HBK.) Woodson, Ann. Mo. Bot. Gard. 19: 73. 1932.

*Echites Boliviana* Britton, in Rusby, Mem. Torrey Bot. Club 4: 219. 1895 = **Mandevilla antennacea** (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites antennacea* A. DC. in DC. Prodr. 8: 456. 1844).

*Echites brachyloba* (Muell.-Arg.) Miers, Apoc. So. Am. 203. 1878 = **Mandevilla brachyloba** (Muell.-Arg.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Amblyanthera brachyloba* Muell.-Arg. Linnaea 30: 423. 1860).

*Echites Brachysiphon* Torr. Bot. Mex. Bound. Surv. 158. 1859 = **Macrosiphonia Brachysiphon** (Torr.) A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 83. 1878.

*Echites brachystachya* Benth. in Hook. Jour. Bot. 3: 248. 1841 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites bracteata* HBK. Nov. Gen. 3: 217. 1819 = **Mandevilla bracteata** (HBK.) O. Ktze. Rev. Gen. 2: 414. 1891.

*Echites bracteata* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 41. 1827, not HBK. or Mart. = **Forsteronia Velloziana** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 21: 622. 1934 (*Echites Velloziana* A. DC. in DC. Prodr. 8: 474. 1844).

*Echites bracteosa* Rusby, Mem. N. Y. Bot. Gard. 7: 325. 1927 = **Mandevilla bracteosa** (Rusby) Woodson, Ann. Mo. Bot. Gard. 20: 742. 1933.

*Echites breviflora* Urb. Symb. Ant. 5: 464. 1908 = **Mesechites angustifolia** (Poir.) Miers, Apoc. So. Am. 230. 1878 (*Echites angustifolia* Poir. Encycl. Suppl. 2: 537. 1812).

*Echites brevipes* Benth. Pl. Hartw. 216. 1845 = **Mesechites citrifolia** (HBK.) Woodson, Ann. Mo. Bot. Gard. 19: 387. 1932 (*Echites citrifolia* HBK. Nov. Gen. 3: 216. 1819).

*Echites Brownei* (A. DC.) Muell.-Arg. Linnaea 30: 446.



1860 (*Echites torosa* Jacq.  $\beta$  *Brownei* A. DC. in DC. Prodr. 8: 449. 1844) = **Mandevilla torosa** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 19: 64. 1932 (*Echites torosa* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites calycosa* A. Rich. in Sagra, Hist. Cuba 11: 94. 1850 = **Asketanthera calycosa** (A. Rich.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

*Echites campanulata* Sesse & Moc. Fl. Mex. 44. 1887. Description impossible to interpret.

*Echites campestris* Vell. Fl. Flum. 113. 1830; Icon. 3: pl. 43. 1827 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites canescens* Willd. ex R. & S. Syst. 4: 795. 1819 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites Catesbaei* G. Don, Gen. Hist. 4: 74. 1838 = **Urechites lutea** (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites Chilensis* A. DC. in DC. Prodr. 8: 468. 1844 = **Elytropus chilensis** (A. DC.) Muell.-Arg. Linnaea 30: 140. 1860.

*Echites chlorantha* Schlecht. Linnaea 26: 663. 1853 = **Mesechites trifida** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites Christophoriana* Ham. Prodr. 31. 1825. This may refer to *Mesechites repens* (Jacq.) Miers, as indicated by the description of small oval leaves, dichotomous lateral inflorescence, and small yellow flowers.

*Echites ciliata* Stadelm. Flora 24<sup>1</sup>: Beibl. 32. 1841 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites cinerea* A. Rich. in Sagra, Hist. Cuba 11: 93. 1850 = **Haplophyton cinereum** (A. Rich.) Woodson, comb. nov. (*H. cimidum* A. DC.). An unnumbered collection by Sagra bear-

ing the notation "*Echites cinerea*" is apparently the type specimen of this species. It is at present incorporated in the Natural History Museum at Vienna with the types of many others of Richard's Cuban species; and although the identity of the plant (represented in duplicate) is scarcely open to question, one can hardly avoid doubting the place of collection, as the genus *Haplophyton* is apparently limited in distribution to the semi-arid portions of northern Mexico and the southwestern United States.

*Echites circinalis* Sw. Prodr. 52. 1788 = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites citrifolia* HBK. Nov. Gen. 3: 216. 1819 = **Mesechites citrifolia** (HBK.) Woodson, Ann. Mo. Bot. Gard. 20: 637. 1933.

*Echites citrina* A. DC. in DC. Prodr. 8: 474. 1844 = **Marsdenia** sp. (perhaps closely related to *M. fusca* Wright).

*Echites coalita* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 40. 1827 = **Prestonia coalita** (Vell.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

*Echites Cobanensis* Donn. Sm. Bot. Gaz. 40: 6. 1905 = **Mandevilla tubiflora** (Mart. & Gal.) Woodson, Ann. Mo. Bot. Gard. 19: 52. 1932 (*Echites tubiflora* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 358. 1844).

*Echites coccinea* Hook. & Arn. in Hook. Jour. Bot. 1: 286. 1834 = **Mandevilla coccinea** (Hook. & Arn.) Woodson, Ann. Mo. Bot. Gard. 20: 734. 1933.

*Echites cognata* Stadelm. Flora 24<sup>1</sup>: Beibl. 79. 1841 = **Odontadenia cognata** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 18: 546. 1931.

*Echites comosa* O. Ktze. Rev. Gen. 2: 414. 1891 = **Mandevilla villosa** (Miers) Woodson, Ann. Mo. Bot. Gard. 19: 70. 1932 (*Laseguea villosa* Miers, Apoc. So. Am. 250. 1878).

*Echites concolor* Ham. Prodr. 31. 1825. This may refer to **Mesechites angustifolia** (Poir.) Miers, Apoc. So. Am. 230. 1878 (*Echites angustifolia* Poir. Encycl. Suppl. 2: 537. 1812).

*Echites congesta* HBK. Nov. Gen. 3: 214. 1819 = **Mandevilla congesta** (HBK.) Woodson, Ann. Mo. Bot. Gard. 20: 675. 1933.

*Echites convolvulacea* A. DC. in DC. Prodr. 8: 451. 1844 = **Mandevilla convolvulacea** (A. DC.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882.

*Echites cordata* A. DC. in DC. Prodr. 8: 451. 1844. This is probably referable to **Mandevilla convolvulacea** (A. DC.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882 (*Echites convolvulacea* A. DC. loc. cit. 1844).

*Echites coriacea* Benth. in Hook. Jour. Bot. 3: 249. 1841 = **Odontadenia geminata** (R. & S.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 119. 1860 (*Echites geminata* R. & S. Syst. 4: 796. 1819).

*Echites corymbosa* Jacq. Enum. Pl. Carib. 13. 1760 = **Forsteronia corymbosa** (Jacq.) G. F. W. Meyer, Prim. Fl. Esseq. 134. 1818.

*Echites Coulteri* S. Wats. Proc. Am. Acad. 18: 113. 1882-83 = **Mandevilla Karwinskii** (Muell.-Arg.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882 (*Amblyanthera Karwinskii* Muell.-Arg. Linnaea 30: 426. 1860).

*Echites crassinoda* Gardn. ex Hook. Lond. Jour. Bot. 1: 544. 1842 = **Mandevilla crassinoda** (Gardn.) Woodson, Ann. Mo. Bot. Gard. 20: 703. 1933.

*Echites crassipes* A. Rich. in Sagra, Hist. Cuba 11: 91. 1850 = **Echites umbellata** Jacq. var. **crassipes** (A. Rich.) Gomez, Anal. Soc. Espan. Hist. Nat. 23: 274. 1894.

*Echites cubensis* (Muell.-Arg.) Griseb. Cat. Pl. Cub. 172. 1866 (*Rhabdadenia cubensis* Muell.-Arg. Linnaea 30: 435. 1860) = **Angadenia Berterii** (A. DC.) Miers, Apoc. So. Am. 180. 1878 (*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844).

*Echites Cururu* Mart. in Buchn. Rep. Pharm. 101. 1830 = **Odontadenia puncticulosa** (A. Rich.) Pulle, Enum. Pl. Surinam 383. 1906 (*Echites puncticulosa* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites cuspidifera* Blake, Contr. Gray Herb. 52: 79. 1917 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites Cuyabensis* A. DC. in DC. Prodr. 8: 462. 1844 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat.

Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites cyaniphylla* Rusby, Bull. N. Y. Bot. Gard. 4: 409. 1907 = *Prestonia cyaniphylla* (Rusby) Woodson, Ann. Mo. Bot. Gard. 23: 284. 1936.

*Echites densevenulosa* Stadelm. Flora 24<sup>1</sup>: Beibl. 47. 1841 = *Odontadenia lutea* (Vell.) Mgf. in Fedde, Rep. Sp. Nov. 20: 24. 1924 (*Echites lutea* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 25. 1827).

*Echites densiflora* Pohl, ex Stadelm. Flora 24<sup>1</sup>: Beibl. 56. 1841 = *Mandevilla pycnantha* (Steud.) Woodson, Ann. Mo. Bot. Gard. 19: 60. 1932 (*Echites pycnantha* Steud. Nomencl. ed. 2. 1: 540. 1840).

*Echites denticulata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 30. 1827 = *Prestonia denticulata* (Vell.) Woodson, Ann. Mo. Bot. Gard. 23: 328. 1936.

*Echites dichotoma* HBK. Nov. Gen. 3: 217. 1819. This apparently refers to *Mesechites trifida* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites didyma* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 27. 1827 = *Prestonia didyma* (Vell.) Woodson, Ann. Mo. Bot. Gard. 23: 308. 1936.

*Echites difformis* Walt. Fl. Carol. 98. 1788 = *Trachelospermum difforme* (Walt.) A. Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 85. 1878.

*Echites disadena* Miq. Stirp. Surinam. Select. 156. 1851 = *Mesechites trifida* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites dolichopetala* Urb. Symb. Ant. 7: 335. 1912 = *Asketanthera dolichopetala* (Urb.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

*Echites domingensis* Jacq. Icon. Pl. Rar. 1: 6. pl. 53. 1782 = *Urechites lutea* (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites dubia* Vell. Fl. Flum. 114. 1830; Icon. 3: pl. 50. 1827 = *Cissampelos ovalifolia* DC. Syst. 1: 537. 1818.

*Echites Dusenii* Malme, Arkiv f. Bot. **22A**<sup>2</sup>: 9. 1928 = *Prestonia Dusenii* (Malme) Woodson, Ann. Mo. Bot. Gard. **18**: 552. 1931.

*Echites Eggersii* Mgf. Notizblatt **9**: 78. 1924 = *Laubertia Boissierii* A. DC. in DC. Prodr. **8**: 487. 1844.

*Echites Ehrenbergii* Schlecht. Linnaea **26**: 666. 1853 = *Rhabdadenia biflora* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. **6**<sup>1</sup>: 175. 1860 (*Echites biflora* Jacq. Enum. Pl. Carib. **13**. 1760).

*Echites elegans* Benth. in Hook. Jour. Bot. **3**: 249. 1841 = *Odontadenia geminata* (R. & S.) Muell.-Arg. in Mart. Fl. Bras. **6**<sup>1</sup>: 119. 1860 (*Echites geminata* R. & S. Syst. **4**: 795. 1819).

*Echites emarginata* Vell. Fl. Flum. **113**. 1830; Icon. **3**: pl. 46. 1827 = *Mandevilla erecta* (Vell.) Woodson, Ann. Mo. Bot. Gard. **19**: 62. 1932 (*Echites erecta* Vell. loc. cit. 1830; loc. cit. pl. 45. 1827).

*Echites erecta* Vell. Fl. Flum. **113**. 1830; Icon. **3**: pl. 45. 1827 = *Mandevilla erecta* (Vell.) Woodson, Ann. Mo. Bot. Gard. **19**: 62. 1932.

*Echites erecta* A. DC. in DC. Prodr. **8**: 469. 1844, non Vell. = *Rhodocalyx rotundifolius* Muell.-Arg. in Mart. Fl. Bras. **6**<sup>1</sup>: 173. pl. 51. 1860.

*Echites exilicaulis* Sesse & Moc. Fl. Mex. **45**. 1887. Description impossible to interpret.

*Echites ferruginea* A. Rich. in Sagra, Hist. Cuba **11**: 92. 1850 = *Angadenia Berterii* (A. DC.) Miers, Apoc. So. Am. **180**. 1878 (*Echites Berterii* A. DC. in DC. Prodr. **8**: 447. 1844).

*Echites floribunda* Sw. Prodr. **52**. 1788 = *Forsteronia floribunda* (Sw.) G. F. W. Meyer, Prim. Fl. Esseq. **135**. 1818.

*Echites fluminensis* A. DC. in DC. Prodr. **8**: 452. 1844 = *Mandevilla hirsuta* (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. **4**<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris **1**: 107. 1792, non R. & P.).

*Echites fragrans* Stadelm. Flora **24**<sup>1</sup>: Beibl. **71**. 1841 = *Mandevilla fragrans* (Stadelm.) Woodson, Ann. Mo. Bot. Gard. **20**: 713. 1933.

*Echites Franciscea* A. DC. in DC. Prodr. **8**: 452. 1844 = *Temnadenia violacea* (Vell.) Miers, Apoc. So. Am. **208**. 1878



(*Echites violacea* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 31. 1827).

*Echites Fraseri* Willd. ex R. & S. Syst. 4: 796. 1819. The identity of this species cannot be ascertained from the ambiguous reference.

*Echites funiformis* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 29. 1827 = **Mandevilla funiformis** (Vell.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites galegiformis* Rudolph, ex Ledeb. Pl. S. Dom. 6. 1805. Reference too vague for identification.

*Echites geminata* R. & S. Syst. 4: 795. 1819 = **Odontadenia geminata** (R. & S.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 119. 1860.

*Echites glandulosa* Poir. Encycl. Suppl. 2: 537. 1812. Reference too vague for identification.

*Echites glandulosa* R. & P. Fl. Peruv. 2: 19. pl. 135. 1799 = **Mandevilla glandulosa** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 66. 1932.

*Echites glaucescens* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 358. 1844 = **Mandevilla oaxacana** (A. DC.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882 (*Echites Oaxacana* A. DC. in DC. Prodr. 8: 451. 1844).

*Echites glomerata* Poir. Encycl. Suppl. 2: 536. 1812. Possibly asclepiadaceous.

*Echites gracilipes* Stadelm. Flora 24<sup>1</sup>: Beibl. 22. 1841 = **Odontadenia gracilipes** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 22: 294. 1935.

*Echites gracilis* HBK. Nov. Gen. 3: 219. 1819 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites grandiflora* Desf. ex Hook. Jour. Bot. 1: 286. 1834 = **Macrosiphonia longiflora** (Desf.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 140. 1860 (*Echites longiflora* Desf. Mem. Mus. Paris 5: 275. pl. 20. 1819).

*Echites grandiflora* G. F. W. Meyer, Prim. Fl. Esseq. 131. 1818 = **Odontadenia Hoffmannseggiana** (Steud.) Woodson, in Gleason & A. C. Smith, Bull. Torrey Bot. Club 60: 392. 1933 (*Echites Hoffmannseggiana* Steud. Nomencl. ed. 2. 1: 539. 1840).



*Echites Guarantica* St. Hil. Mem. Mus. Paris 12: 324. 1825 = **Macrosiphonia longiflora** (Desf.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 140. 1860 (*Echites longiflora* Desf. Mem. Mus. Paris 5: 275. 1819).

*Echites Guianensis* A. DC. in DC. Prodr. 8: 458. 1844 = **Mandevilla subspicata** (Vahl) Mgf. Rec. Trav. Bot. Néerl. 22: 380. 1926 (*Echites subspicata* Vahl, Eclog. Am. 2: 18. 1798).

*Echites heterophylla* J. F. Gmel. Syst. 2: 437. 1791 = **Ur-echites lutea** (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites heterophylla* Miq. Linnaea 25: 653. 1852, non Gmel. = **Elytropus chilensis** (A. DC.) Muell.-Arg. Linnaea 30: 440. 1860 (*Echites Chilensis* A. DC. in DC. Prodr. 8: 468. 1844).

*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites hirsuta* R. & P. Fl. Peruv. 2: 19. pl. 136. 1799, non A. Rich. = **Mandevilla Pavonii** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 73. 1932 (*Echites Pavonii* A. DC. in DC. Prodr. 8: 463. 1844).

*Echites hirtella* HBK. Nov. Gen. 3: 213. 1819 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites hirtiflora* A. DC. in DC. Prodr. 8: 456. 1844 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites hispida* Willd. ex R. & S. Syst. 4: 795. 1819 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites Hoffmannseggiana* Steud. Nomencl. ed. 2. 1: 539. 1840 = **Odontadenia Hoffmannseggiana** (Steud.) Woodson, in Gleason & A. C. Smith, Bull. Torrey Bot. Club 60: 392. 1933.

*Echites holosericea* Sesse & Moc. Fl. Mex. 45. 1887. Description impossible to interpret.

*Echites Hookeri* A. DC. in DC. Prodr. 8: 476. 1844. Possibly a species of *Mandevilla*. Type specimen (*Tweedie s.n.* in hb. Kew.) fragmentary.

*Echites Hulkiana* Pulle, Rec. Trav. Bot. Néerl. 9: 160. 1912 = *Prestonia acutifolia* (Benth.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895 (*Haemadictyon acutifolium* Benth. ex Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 167. 1860).

*Echites hypoglaucula* Stadelm. Flora 24<sup>1</sup>: Beibl. 23. 1841 = *Odontadenia hypoglaucula* (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 118. 1860.

*Echites hypoleuca* Benth. Pl. Hartw. 23. 1839 = *Macrosiphonia hypoleuca* (Benth.) Muell.-Arg. Linnaea 30: 452. 1860.

*Echites illustris* Vell. Fl. Flum. 114. 1830; Icon. 3: pl. 49. 1827 = *Mandevilla illustris* (Vell.) Woodson, Ann. Mo. Bot. Gard. 20: 727. 1933.

*Echites insignis* Spreng. Syst. 1: 632. 1825. Possibly refers to *Odontadenia Hoffmannseggiana* (Steud.) Woodson.

*Echites istmica* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 39. 1827 = *Condylocarpon* sp.

*Echites jamaicensis* Griseb. Fl. Brit. W. I. 416. 1861 = *Urechites lutea* (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites japurensis* Stadelm. Flora 24<sup>1</sup>: Beibl. 19. 1841. = *Mesechites trifida* (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites jasminiflora* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 357. 1844 = *Mandevilla subsagittata* (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites javitensis* HBK. Nov. Gen. 3: 220. 1819 = *Mandevilla javitensis* (HBK.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites Karwinskii* (Muell.-Arg.) Miers, Apoc. So. Am. 206. 1878 (*Amblyanthera Karwinskii* Muell.-Arg. Linnaea 30: 426. 1860) = *Mandevilla Karwinskii* (Muell.-Arg.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882.

*Echites lanata* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 359. 1844. Possibly refers to *Mandevilla subsagittata* (R. & P.) Woodson. The type specimen evidently has been lost.

*Echites lanuginosa* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 357. 1844 = **Macrosiphonia lanuginosa** (Mart. & Gal.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882.

*Echites lanuginosa* Sesse & Moc. Fl. Mex. 44. 1887, non Mart. & Gal. Impossible to interpret.

*Echites lappulacea* Lam. Encycl. 2: 341. 1786 = **Anechites lappulacea** (Lam.) Miers, Apoc. So. Am. 237. 1878.

*Echites lasiocarpa* A. DC. in DC. Prodr. 8: 463. 1844 = **Mandevilla lasiocarpa** (A. DC.) Malme, Bihang till K. Sv. Vet. Akad. Handl. Afd. III. 24<sup>10</sup>: 25. 1899.

*Echites lateriflora* Sesse & Moc. La Naturaleza II. 1: Suppl. 28. 1888. Impossible to interpret.

*Echites Laurentiae-disca* Rusby, Descr. So. Am. Pl. 85. 1920 = **Prestonia acutifolia** (Benth.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895 (*Haemadictyon acutifolium* Benth. ex Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 167. 1860).

*Echites laxa* R. & P. Fl. Peruv. 2: 19. pl. 134b. 1799 = **Mandevilla laxa** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 68. 1932.

*Echites leptoloba* Stadelm. Flora 24<sup>1</sup>: Beibl. 15. 1841 = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites leptophylla* A. DC. in DC. Prodr. 8: 455. 1844 = **Mandevilla leptophylla** (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites Lindeniana* (Muell.-Arg.) Griseb. Cat. Pl. Cub. 173. 1866 (*Rhabdadenia Lindeniana* Muell.-Arg. Linnaea 30: 437. 1860) = **Angadenia Lindeniana** (Muell.-Arg.) Miers, Apoc. So. Am. 180. 1878.

*Echites linearifolia* Ham. Prodr. 31. 1825 = **Mesechites angustifolia** (Poir.) Miers, Apoc. So. Am. 230. 1878 (*Echites angustifolia* Poir. Encycl. Suppl. 2: 537. 1812).

*Echites linearifolia* Stadelm. Flora 24<sup>1</sup>: Beibl. 18. 1841, non Ham. = **Mandevilla leptophylla** (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites leptophylla* A. DC. in DC. Prodr. 8: 455. 1844).

*Echites linearis* Vell. Fl. Flum. 111. 1830; Icon. 3: pl. 36. 1827. Possibly referable to *Forsteronia*.

*Echites longiflora* Desf. Mem. Mus. Paris 5: 275. 1819 = **Macrosiphonia longiflora** (Desf.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 140. 1860.

*Echites longiflora* Ekm. & Helwig, Arkiv f. Bot. 22A<sup>10</sup>: 45. 1929, non Desf. = **Asketanthera Ekmaniana** Woodson, Ann. Mo. Bot. Gard. 23: 267. 1936.

*Echites longifolia* Sesse & Moc. Fl. Mex. 45. 1887. May possibly refer to *E. tuxtlensis* Standl.

*Echites lucida* R. & S. Syst. 4: 795. 1819 = **Odontadenia nitida** (Vahl) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 118. 1860 (*Echites nitida* Vahl, Eclog. 2: 19. pl. 13. 1798).

*Echites lutea* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 25. 1827 = **Odontadenia lutea** (Vell.) Mgf. in Fedde, Rep. Sp. Nov. 20: 24. 1924.

*Echites macrantha* R. & S. Syst. 4: 795. 1819, non Spreng. = **Odontadenia Hoffmannseggiana** (Steud.) Woodson, in Gleason & A. C. Smith, Bull. Torrey Bot. Club 60: 392. 1933 (*Echites Hoffmannseggiana* Steud. Nomencl. ed. 2. 1: 539. 1840).

*Echites macrocalyx* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 160. 1860 = **Peltastes peltatus** (Vell.) Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932 (*Echites peltata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 32. 1827).

*Echites ? macrocarpa* A. Rich. in Sagra, Hist. Cuba 11: 94. 1850, non Wall. = **Catalpa macrocarpa** (A. Rich.) Ekman, in Urb. Symb. Ant. 9: 254. 1924.

*Echites macrophylla* HBK. Nov. Gen. 3: 218. 1819, non Roxb. = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites macrophylla* A. Zahlbr. Ann. K. K. Naturh. Hofmus. Wien 7: 5. 1892, nec HBK., nec Roxb. = **Mandevilla subpaniculata** Woodson, Ann. Mo. Bot. Gard. 19: 71. 1932.

*Echites Macrosiphon* Torr. Bot. Mex. Bound. Surv. 158. pl. 43. 1859 = **Macrosiphonia Macrosiphon** (Torr.) A. A. Heller, Muhlenbergia 1: 2. 1900.

*Echites macrostoma* Benth. in Hook. Jour. Bot. 3: 248. 1841  
= **Rhabdadenia macrostoma** (Benth.) Muell.-Arg. Linnaea 30:  
435. 1860.

*Echites maculata* (Descourt.) A. DC. in DC. Prodr. 8: 474.  
1844 (*Apocynum maculatum* Descourt. Fl. Med. Antill. 3: 176.  
pl. 190. 1827). Probably referable to the asclepiadaceous  
genus *Marsdenia*.

*Echites madida* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 42.  
1827. Possibly referable to *Mandevilla*.

*Echites Mansoana* A. DC. in DC. Prodr. 8: 448. 1844 =  
**Mesechites Mansoana** (A. DC.) Woodson, Ann. Mo. Bot. Gard.  
20: 636. 1933.

*Echites mapirensis* H. Winkl. in Fedde, Rep. Sp. Nov. 7: 113.  
1909. Possibly referable to *Mesechites acuminata* (R. & P.)  
Muell.-Arg. Linnaea 30: 446. 1860. The type specimen (*Buch-*  
*tien* 1954) has not been available for study.

*Echites Maranhamensis* G. Don, Gen. Hist. 4: 74. 1838 =  
**Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat.  
Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4:  
795. 1819).

*Echites Martiana* Stadelm. Flora 24<sup>1</sup>: Beibl. 31. 1841 =  
**Mandevilla Martiana** (Stadelm.) Woodson, Ann. Mo. Bot.  
Gard. 20: 702. 1933.

*Echites Martii* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 155. 1860  
= **Prestonia coalita** (Vell.) Woodson, Ann. Mo. Bot. Gard. 18:  
552. 1931 (*Echites coalita* Vell. Fl. Flum. 112. 1830; Icon. 3:  
pl. 40. 1827).

*Echites Maximiliana* Stadelm. Flora 24<sup>1</sup>: Beibl. 43. 1841  
= **Temnadenia violacea** (Vell.) Miers, Apoc. So. Am. 208. 1878  
(*Echites violacea* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 31.  
1827).

*Echites Meg'agros* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 33.  
1827 = **Prestonia Meg'agros** (Vell.) Woodson, Ann. Mo. Bot.  
Gard. 23: 329. 1936.

*Echites membranacea* A. DC. in DC. Prodr. 8: 457. 1844 =  
**Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot.  
Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2:  
19. 1799).



*Echites mexicana* (Muell.-Arg.) Miers, Apoc. So. Am. 205. 1878 (*Amblyanthera mexicana* Muell.-Arg. Linnaea 30: 424. 1860) = **Mandevilla mexicana** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 19: 65. 1932.

*Echites microcalyx* A. DC. in DC. Prodr. 8: 456. 1844 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites microphylla* Stadelm. Flora 24<sup>1</sup>: Beibl. 35. 1841 = **Mandevilla funiformis** (Vell.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites funiformis* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 29. 1827).

*Echites minima* Britton & Wilson, Mem. Torrey Bot. Club 16: 94. 1920 = **Mesechites minima** (Britton & Wilson) Woodson, Ann. Mo. Bot. Gard. 19: 386. 1932.

*Echites mollissima* HBK. Nov. Gen. 3: 218. 1819 = **Mandevilla mollissima** (HBK.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites montana* HBK. Nov. Gen. 3: 213. 1819 = **Mandevilla montana** (HBK.) Mgf. Notizblatt 9: 82. 1924.

*Echites mucronata* R. & S. Syst. 4: 796. 1819 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites* ? *muricata* A. DC. in DC. Prodr. 8: 474. 1844. Based upon Descourt. Fl. Med. Antill. 3: 171. pl. 189. 1827. Evidently asclepiadaceous.

*Echites myrtifolia* R. & S. Syst. 4: 795. 1819, non Poir. = **Mesechites rosea** (A. DC.) Miers, Apoc. So. Am. 232. 1878 (*Echites rosea* A. DC. in DC. Prodr. 8: 450. 1844).

*Echites neriandra* Griseb. Fl. Brit. W. I. 415. 1861 = **Ur-echites lutea** (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites nitida* Vahl, Eclog. 2: 19. pl. 13. 1798 = **Odontadenia nitida** (Vahl) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 118. 1860.

*Echites nodosa* R. & S. Syst. 4: 796. 1819. Based upon a sterile specimen which is impossible to determine accurately.



*Echites nutans* Anders. Trans. Soc. Arts London 25: 203. 1807 = **Prestonia quinquangularis** (Jacq.) Spreng. Syst. 1: 637. 1825 (*Echites quinquangularis* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites Oaxacana* A. DC. in DC. Prodr. 8: 451. 1844 = **Mandevilla oaxacana** (A. DC.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882.

*Echites oblongifolia* Ham. Prodr. 30. 1825. Perhaps referable to *Mesechites*.

*Echites obovata* Nees, ex Steud. Nomencl. ed. 2. 1: 540. 1840. Based upon *E. variegata* Schrad. Goett. Gel. Anz. 1: 707. 1821, a *nomen subnudum* incapable of interpretation.

*Echites obovata* Sesse & Moc. Fl. Mex. 43. 1887. May refer to *Urechites lutea* (L.) Britton.

*Echites obtusifolia* Sesse & Moc. Fl. Mex. 45. 1887. Impossible to interpret.

*Echites odorifera* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 28. 1827. The plate cited has somewhat the aspect of a *Temnadenia*, but is not capable of identification.

*Echites ornata* Hoehne, Comm. Linh. Electr. Estrat. Matto Grosso, Anexo 5, Bot. 6: 82. pls. 120; 131, fig. 1. 1915 = **Temnadenia ornata** (Hoehne) Woodson, Ann. Mo. Bot. Gard. 19: 383. 1932.

*Echites ? ovalifolia* Hook. & Arn. in Hook. Jour. Bot. 1: 286. 1834. Type specimen (*Tweedie s.n.* in Hb. Kew.) fragmentary, possibly asclepiadaceous.

*Echites ovalifolia* Poir. Encycl. Suppl. 2: 535. 1812. Considered by Miers (Apoc. So. Am. 248. 1878) to be a *Forsteronia*. If so, it possibly represents *F. spicata* (Jacq.) G. F. W. Meyer, of which, however, we have no authenticated specimens from Hispaniola.

*Echites ovalis* Mgf. Notizblatt 9: 79. 1924 = **Allomarkgrafia ovalis** (Mgf.) Woodson, Ann. Mo. Bot. Gard. 19: 45. 1932.

*Echites pallida* Miers, Apoc. So. Am. 195. 1878 = **Mesechites trifida** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites paludosa* Vahl, *Eclog.* 2: 19. 1798 = **Rhabdadenia biflora** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 175. 1860 (*Echites biflora* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites pandurata* A. DC. in DC. Prodr. 8: 458. 1844 = **Fernaldia pandurata** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 48. 1932.

*Echites paniculata* Poir. Encycl. Suppl. 2: 536. 1811. Diagnosis impossible to interpret.

*Echites parviflora* Sesse & Moc. Fl. Mex. 44. 1887. Impossible to interpret.

*Echites pastorum* Mart. ex Stadelm. Flora 24<sup>1</sup>: Beibl. 52. 1841 = **Mandevilla tenuifolia** (Mikan) Woodson, Ann. Mo. Bot. Gard. 20: 679. 1933 (*Echites tenuifolia* Mikan, Fl. & Faun. Bras. fasc. 3. 1820).

*Echites Pavonii* A. DC. in DC. Prodr. 8: 463. 1844 = **Mandevilla Pavonii** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 73. 1932.

*Echites peduncularis* Stadelm. Flora 24<sup>1</sup>: Beibl. 54. 1841 = **Mandevilla tenuifolia** (Mikan) Woodson, Ann. Mo. Bot. Gard. 20: 679. 1933 (*Echites tenuifolia* Mikan, Fl. & Faun. Bras. fasc. 3. 1820).

*Echites peltata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 32. 1827 = **Peltastes peltatus** (Vell.) Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932.

*Echites peltigera* Stadelm. Flora 24<sup>1</sup>: Beibl. 21. 1841 = **Stipecoma peltigera** (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 176. 1860.

*Echites petraea* St. Hil. Mem. Mus. Paris 12: 322. 1825 = **Macrosiphonia petraea** (St. Hil.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 168. 1895.

*Echites Picardae* Urb. Symb. Ant. 5: 466. 1908 = **Asketanthera Picardae** (Urb.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

*Echites pilosa* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 38. 1827 = **Forsteronia pilosa** (Vell.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 99. 1860.

*Echites pinguiifolia* Standl. Field Mus. Publ. Bot. 8: 35. 1930

= **Fernaldia pandurata** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 48. 1932.

*Echites pinifolia* St. Hil. Mem. Mus. Paris 12: 325. 1825 = **Macrosiphonia petraea** (St. Hil.) K. Sch. var. **minor** (Hook.) Woodson, Ann. Mo. Bot. Gard. 23: 376. 1936 (*Echites grandiflora* Desf. var. **minor** Hook. Jour. Bot. 1: 286. 1834).

*Echites plicata* A. DC. in DC. Prodr. 8: 454. 1844 = **Peltastes peltatus** (Vell.) Woodson, Ann. Mo. Bot. Gard. 19: 376. 1932 (*Echites peltata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 32. 1827).

*Echites Pohliana* Stadelm. Flora 24<sup>1</sup>: Beibl. 73. 1841 = **Mandevilla velutina** (Mart.) Woodson var. **angustifolia** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 23: 376. 1936 (*Echites Pohliana* Stadelm. var.  $\alpha$  **angustifolia** Stadelm. loc. cit. 1841).

*Echites portobellensis* Beurl. Vet. Akad. Handl. Stockh. 137. 1854 (1856) = **Prestonia portobellensis** (Peurl.) Woodson, Ann. Mo. Bot. Gard. 18: 553. 1931.

*Echites Prieurei* A. DC. in DC. Prodr. 8: 458. 1844 = **Mandevilla subspicata** (Vahl) Mgf. Rec. Trav. Bot. Néerl. 22: 380. 1926 (*Echites subspicata* Vahl, Eclog. 2: 18. 1798).

*Echites psidiifolia* Mart. ex Stadelm. Flora 24<sup>1</sup>: Beibl. 46. 1841. Possibly refers to *Odontadenia*. The type specimen has apparently been lost.

*Echites ptarmica* Poepp. Gen. 3: 69. pl. 278. 1845 = **Elytropus chilensis** (A. DC.) Muell.-Arg. Linnaea 30: 440. 1860 (*Echites Chilensis* A. DC. in DC. Prodr. 8: 468. 1844).

*Echites puberula* Michx. Fl. Bor. Am. 1: 120. 1803 = **Trachelospermum difforme** (Walt.) A. Gray, Syn. Fl. N. Am. 2: 85. 1878 (*Echites difformis* Walt. Fl. Carol. 98. 1788).

*Echites pubescens* Hook. & Arn. Bot. Beechey Voy. 34. 1830, non R. & S. = **Elytropus chilensis** (A. DC.) Muell.-Arg. Linnaea 30: 440. 1860 (*Echites Chilensis* A. DC. in DC. Prodr. 8: 468. 1844).

*Echites pubescens* R. & S. Syst. 4: 796. 1819 = **Mandevilla congesta** (HBK.) Woodson, Ann. Mo. Bot. Gard. 20: 675. 1933 (*Echites congesta* HBK. Nov. Gen. 3: 214. 1819).

*Echites pubiflora* G. Don, Gen. Hist. 4: 73. 1838 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites pulchella* Gardn. ex Hook. Icon. Pl. 5: pl. 470. 1842 = **Mandevilla spigeliaeflora** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 20: 736. 1933 (*Echites* (?) *spigeliaeflora* Stadelm. Flora 24<sup>1</sup>: Beibl. 58. 1841).

*Echites puncticulosa* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792 = **Odontadenia puncticulosa** (A. Rich.) Pulle, Enum. Pl. Surinam, 383. 1906.

*Echites pycnantha* Steud. ex A. DC. in DC. Prodr. 8: 469. 1844 = **Mandevilla pycnantha** (Steud.) Woodson, Ann. Mo. Bot. Gard. 19: 60. 1932.

*Echites quinquangularis* Jacq. Enum. Pl. Carib. 13. 1760 = **Prestonia quinquangularis** (Jacq.) Spreng. Syst. 1: 637. 1825.

*Echites repens* Jacq. Enum. Pl. Carib. 13. 1760 = **Mesechites repens** (Jacq.) Miers, Apoc. So. Am. 229. 1878.

*Echites revoluta* A. DC. in DC. Prodr. 8: 457. 1844 = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites revoluta* Sesse & Moc. Fl. Mex. 44. 1887. Impossible to interpret.

*Echites Richardi* R. & S. Syst. 4: 391. 1819 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites* (?) *Riedelii* (Muell.-Arg.) Malme, Bull. Herb. Boiss. II. 4: 196. 1904 (*Haemadictyon Riedelii* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 170. 1860) = **Prestonia Riedelii** (Muell.-Arg.) Mgf. in Fedde, Rep. Spec. Nov. 20: 26. 1924.

*Echites rigida* Rusby, Mem. N. Y. Bot. Gard. 7: 325. 1927 = **Mesechites trifida** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites riparia* HBK. Nov. Gen. 3: 214. 1819 = **Mandevilla riparia** (HBK.) Woodson, Ann. Mo. Bot. Gard. 19: 58. 1932.

*Echites Rosa-campestris* Endl. in Harting, Parad. Vindob. 1: pl. 51. 1844-47 = **Mandevilla illustris** (Vell.) Woodson, Ann. Mo. Bot. Gard. 20: 727. 1933 (*Echites illustris* Vell. Fl. Flum. 114. 1830; Icon. 3: pl. 49. 1827).

*Echites Rosana* Donn. Sm. Bot. Gaz. 40: 6. 1905 = **Mandevilla Rosana** (Donn. Sm.) Woodson, Ann. Mo. Bot. Gard. 20: 652. 1932.

*Echites rosea* A. DC. in DC. Prodr. 8: 450. 1844 = **Mesechites rosea** (A. DC.) Miers, Apoc. So. Am. 232. 1878.

*Echites rubricaulis* Poir. Encycl. Suppl. 2: 535. 1812. Apparently refers to *Mesechites trifida* (Jacq.) Muell.-Arg. or a related species.

*Echites Rugeliana* Urb. Symb. Ant. 5: 465. 1908 = **Asket-anthera calycosa** (A. Rich.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932 (*Echites calycosa* A. Rich. in Sagra, Hist. Cuba 11: 94. 1850).

*Echites rugellosa* A. Rich. Actes Soc. Nat. Hist. Paris 1: 107. 1792. Incapable of identification.

*Echites rugosa* Benth. in Hook. Jour. Bot. 3: 248. 1841 = **Mandevilla rugosa** (Benth.) Woodson, Ann. Mo. Bot. Gard. 19: 384. 1932.

*Echites sagittata* Poir. Encycl. Suppl. 2: 537. 1812. Incapable of identification. Perhaps referable to *Mandevilla sub-sagittata* (R. & P.) Woodson.

*Echites Sagraei* A. DC. in DC. Prodr. 8: 450. 1844 = **Angadenia Berterii** (A. DC.) Miers, Apoc. So. Am. 180. 1878 (*Echites Berterii* A. DC. loc. cit. 447. 1844).

*Echites salicifolia* Raf. New Fl. N. Am. 4: 59. 1836, non Willd. = **Trachelospermum difforme** (Walt.) A. Gray, Syn. Fl. N. Am. 2: 85. 1878 (*Echites difformis* Walt. Fl. Carol. 98. 1788).

*Echites salicifolia* Willd. ex R. & S. Syst. 4: 796. 1819 = **Allemanda cathartica** L. Mant. 214. 1771.

*Echites sancta* Stadelm. Flora 24: Beibl. 59. 1841 = **Mandevilla sancta** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 20: 726. 1933.

*Echites Sanctae-Crucis* S. Moore, Trans. Linn. Soc. Bot. II.

4: 396. 1895 = **Mesechites Sanctae-Crucis** (S. Moore) Woodson, Ann. Mo. Bot. Gard. 19: 387. 1932.

*Echites Sanctae-Martae* Rusby, Deser. So. Am. Pl. 85. 1920 = **Laubertia Sanctae-Martae** (Rusby) Woodson, Ann. Mo. Bot. Gard. 18: 555. 1931.

*Echites sanguinolenta* Tussac, Fl. Ant. 95. pl. 11. 1808 = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites scabra* R. & S. Syst. 4: 795. 1819 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites secunda* Sesse & Moc. Fl. Mex. 44. 1887. May refer to *Mandevilla subsagittata* (R. & P.) Woodson.

*Echites secundiflora* A. DC. in DC. Prodr. 8: 457. 1844 = **Mandevilla subsagittata** (R. & P.) Woodson (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites semidigyna* Berg. Verh. Zeeusch. Gen. Wetens. 3: 583. 1773. Probably a species of *Tabernaemontana*.

*Echites sessilis* Vell. Fl. Flum. 111. 1830; Icon. 3: pl. 35. 1827. Incapable of identification. Supposed by Mueller to be a *Malouetia*; a *Thyrsanthus* (*Forsteronia*) according to Miers.

*Echites Smithii* Greenm. Proc. Am. Acad. 40: 29. 1904 = **Mandevilla mexicana** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 19: 65. 1932 (*Amblyanthera mexicana* Muell.-Arg. Linnaea 30: 424. 1860).

*Echites speciosa* HBK. Nov. Gen. 3: 219. 1819 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Echites spectabilis* Stadelm. Flora 24<sup>1</sup>: Beibl. 44. 1841 = **Macropharynx spectabilis** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

*Echites spicata* Jacq. Enum. Pl. Carib. 13. 1760 = **Forsteronia spicata** (Jacq.) G. F. W. Meyer, Prim. Fl. Esseq. 135. 1818.

*Echites* (?) *spigeliaeflora* Stadelm. Flora 24<sup>1</sup>: Beibl. 58. 1841 = **Mandevilla spigeliaeflora** (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 20: 736. 1933.



*Echites splendens* Hook. f. Bot. Mag. n.s. 16: pl. 3976. 1842 = **Mandevilla splendens** (Hook. f.) Woodson, Ann. Mo. Bot. Gard. 20: 707. 1933.

*Echites Stadelmeyeri* Mart. ex Stadelm. Flora 24<sup>1</sup>: Beibl. 29. 1841 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895.

*Echites stellaris* Lindl. Bot. Reg. 20: pl. 1664. 1834 = **Temnadenia stellaris** (Lindl.) Miers, Apoc. So. Am. 210. 1878.

*Echites stellulifera* Lem. Jard. Fleur. 1: pl. 67. 1851. Apparently referable to *Temnadenia stellaris* (Lindl.) Miers.

*Echites suaveolens* (Lindl.) A. DC. in DC. Prodr. 8: 452. 1844 (*Mandevilla suaveolens* Lindl. Bot. Reg. n.s. 3: pl. 7. 1840 = **Mandevilla laxa** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 68. 1932 (*Echites laxa* R. & P. Fl. Peruv. 2: 19. pl. 134b. 1799).

*Echites suaveolens* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 356. 1844, non A. DC. = **Macrosiphonia hypoleuca** (Benth.) Muell.-Arg. Linnaea 30: 452. 1860 (*Echites hypoleuca* Benth. Pl. Hartw. 23. 1839).

*Echites subcarnosa* Benth. in Hook. Jour. Bot. 3: 247. 1841 = **Mandevilla subcarnosa** (Benth.) Woodson, in Gleason, Bull. Torrey Bot. Club 58: 453. 1931.

*Echites subcordata* Sesse & Moc. Fl. Mex. 44. 1887. Impossible to interpret.

*Echites suberecta* Jacq. Enum. Pl. Carib. 13. 1760 = **Ur-echites lutea** (L.) Britton, Bull. N. Y. Bot. Gard. 5: 316. 1907 (*Vinca lutea* L. Cent. II. Pl. 12. 1756).

*Echites suberosa* Vell. Fl. Flum. 111. 1830; Icon. 3: pl. 34. 1827 = **Prestonia denticulata** (Vell.) Woodson, Ann. Mo. Bot. Gard. 23: 328. 1936 (*Echites denticulata* Vell. loc. cit. 110. 1830; Icon. 3: pl. 30. 1827).

*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799 = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932.

*Echites subsessilis* A. DC. in DC. Prodr. 8: 451. 1844 = **Mandevilla subsessilis** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 59. 1932.

*Echites subspicata* Vahl, Eclog. 2: 18. 1798 = **Mandevilla subspicata** (Vahl) Mgf. Rec. Trav. Bot. Néerl. 22: 380. 1926.

*Echites sulphurea* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 26. 1827. Possibly referable to *Prestonia coalita* (Vell.) Woodson.

*Echites surinamensis* Miq. Stirp. Surinam. Select. 155. 1850 = **Mesechites trifida** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites sylvestris* A. DC. in DC. Prodr. 8: 464. 1844 = **Odontadenia Hoffmannseggiana** (Steud.) Woodson, in Gleason & A. C. Smith, Bull. Torrey Bot. Club 60: 392. 1933 (*Echites Hoffmannseggiana* Steud. Nomencl. ed. 2. 1: 539. 1840).

*Echites symphitocarpa* G. F. W. Meyer, Prim. Fl. Esseq. 132. 1818 = **Mandevilla symphitocarpa** (G. F. W. Meyer) Woodson, Ann. Mo. Bot. Gard. 19: 70. 1932.

*Echites syphilitica* L.f. Suppl. 167. 1781. Incapable of identification.

*Echites tenuicaulis* Stadelm. Flora 24<sup>1</sup>: Beibl. 40. 1841 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites tenuifolia* Mikan, Fl. & Faun. Bras. fasc. 3. 1820 = **Mandevilla tenuifolia** (Mikan) Woodson, Ann. Mo. Bot. Gard. 20: 679. 1933.

*Echites thyrsoides* Vell. Fl. Flum. 111. 1830; Icon. 3: pl. 37. 1827 = **Forsteronia thyrsoides** (Vell.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 105. 1860.

*Echites tomentosa* Raf. Fl. Ludovic. 46. 1819, non Vahl. Perhaps referable to *Trachelospermum difforme* (Walt.) A. Gray.

*Echites tomentosa* Vahl, Symb. Bot. 3: 44. 1794 = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792).

*Echites torosa* Jacq. Enum. Pl. Carib. 13. 1760 = **Mandevilla torosa** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 19: 64. 1932.

*Echites torulosa* L. Sp. Pl. ed. 2. 307. 1762 = **Mandevilla torosa** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 19: 64. 1932 (*Echites torosa* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760 = **Mesechites trifida** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860.

*Echites tropaeolifolia* A. DC. in DC. Prodr. 8: 447. 1844 = **Stipecoma peltigera** (Stadelm.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 176. 1860 (*Echites peltigera* Stadelm. Flora 24<sup>1</sup>: Beibl. 21. 1841).

*Echites tubiflora* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 358. 1844 = **Mandevilla tubiflora** (Mart. & Gal.) Woodson, Ann. Mo. Bot. Gard. 19: 52. 1932.

*Echites tubulosa* Benth. in Hook. Jour. Bot. 3: 249. 1841 = **Mesechites trifida** (Jacq.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 151. 1860 (*Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760).

*Echites Tweediana* Hieron. Bol. Acad. Nac. Cordova 4: 370. 1881. Probably referable to *Mandevilla erecta* (Vell.) Woodson.

*Echites umbellata* Sesse & Moc. Fl. Mex. 43. 1887, non Jacq. Apparently refers to a species of *Thenardia*.

*Echites undulata* Sesse & Moc. Fl. Mex. 44. 1887. Impossible to interpret.

*Echites uniflora* Sesse & Moc. La Naturaleza II. 1: Suppl. 28. 1888. Impossible to interpret.

*Echites Valenzuelana* A. Rich. in Sagra, Hist. Cuba 11: 93. 1850 = **Neobracea Valenzuelana** (A. Rich.) Urb. Symb. Ant. 9: 241. 1924.

*Echites varia* Stadelm. Flora 24<sup>1</sup>: Beibl. 17. 1841 = **Temnadenia stellaris** (Lindl.) Miers, Apoc. So. Am. 210. 1878 (*Echites stellaris* Lindl. Bot. Reg. 20: pl. 1664. 1835).

*Echites variegata* Schrad. Goett. Gel. Anz. 1: 707. 1821. Perhaps referable to *Prestonia agglutinata* (Jacq.) Woodson.

*Echites Vauthieri* A. DC. in DC. Prodr. 8: 457. 1844 = **Prestonia coalita** (Vell.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites coalita* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 40. 1827).

*Echites Velame* St. Hil. Bull. Soc. Phil. 77. 1824 = **Macrosiphonia Velame** (St. Hil.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 138. 1860.

*Echites Velloziana* A. DC. in DC. Prodr. 8: 474. 1844 =

**Forsteronia Velloziana** (A. DC.) Woodson, Ann. Mo. Bot. Gard. 21: 622. 1934.

*Echites velutina* Mart. ex Stadelm. Flora 24<sup>1</sup>: Beibl. 72. 1841 = **Mandevilla velutina** (Mart.) Woodson, Ann. Mo. Bot. Gard. 20: 731. 1933.

*Echites venenosa* Stadelm. Flora 24<sup>1</sup>: Beibl. 66. 1841 = **Mandevilla illustris** (Vell.) Woodson, Ann. Mo. Bot. Gard. 20: 727. 1933 (*Echites illustris* Vell. Fl. Flum. 114. 1830; Icon. 3: pl. 49. 1827).

*Echites Veraguasensis* Seem. Bot. Voy. Herald, 168. 1854 = **Mandevilla veraguasensis** (Seem.) Hemsl. Biol. Centr.-Am. Bot. 2: 317. 1882 (where misspelled *veraguensis*).

*Echites verrucosa* R. & S. Syst. 4: 795. 1819 = **Odontadenia verrucosa** (R. & S.) K. Sch. ex Mgf. in Pulle, Fl. Surinam 4: 53. 1932.

*Echites versicolor* Mart. ex Stadelm. Flora 24<sup>1</sup>: Beibl. 38. 1841 = **Mandevilla scabra** (R. & S.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites scabra* R. & S. Syst. 4: 795. 1819).

*Echites verticillata* Sesse & Moc. Fl. Mex. 43. 1887. The authors propose two species under the same specific adjective: one reported from Mexico and one from Porto Rico. Both are impossible to interpret.

*Echites violacea* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 31. 1827 = **Temnadenia violacea** (Vell.) Miers, Apoc. So. Am. 208. 1878.

*Echites virescens* St. Hil. Bull. Soc. Phil. 77. 1824 = **Macrosiphonia virescens** (St. Hil.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 139. 1860.

*Echites* (?) *xanthostoma* Stadelm. Flora 24<sup>1</sup>: Beibl. 55. 1841 = **Mandevilla coccinea** (Hook. & Arn.) Woodson, Ann. Mo. Bot. Gard. 20: 734. 1933 (*Echites coccinea* Hook. & Arn. in Hook. Jour. Bot. 1: 286. 1834).

*Echites Zuccariniana* Stadelm. Flora 24<sup>1</sup>: Beibl. 76. 1841 = **Odontadenia lutea** (Vell.) Mgf. in Fedde, Rep. Sp. Nov. 20: 24. 1924 (*Echites lutea* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 25. 1827).

## XXI. TEMNADENIA Miers, char. emend.

**Temnadenia** Miers, Apoc. So. Am. 207. 1878, in part.

Lactescent, fruticose lianas. Stems volubile, rarely suberect, terete; branches alternate. Leaves opposite, petiolate to subsessile, entire, penninerved, eglandular, the petioles somewhat girdling at the nodes into a slightly dilated, minutely appendiculate, stipular ring. Inflorescence lateral, infrequently subterminal, alternate, scorpioid; peduncle di- or trichotomously compound, infrequently very obscurely so, bearing several to numerous relatively showy, rose or purplish, rarely greenish flowers. Calyx 5-parted, the lobes equal to subequal, imbricated, cleft nearly to the receptacle, bearing within solitary, opposite, more or less erose or lacerate squamellae. Corolla salverform to infundibuliform, the tube not appendiculate nor annulate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, included, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective; pollen granular. Carpels 2, united at the apex by a common stylar shaft surmounted by the fusiform-subcapitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or somewhat concrescent at the base. Follicles 2, apocarpous, terete, dehiscent along the ventral suture, containing many dry, rostrate, apically comose seeds.

Type species: *Temnadenia violacea* (Vell.) Miers, Apoc. So. Am. 208. 1878.

## KEY TO THE SPECIES

- a. Corolla salverform, 2.5–4.0 cm. long; inflorescence dichotomous, usually repeatedly so, rarely trichotomous.
- b. Corolla bright yellow, minutely and densely ferruginous-tomentulose without; plants of Colombia.....1. *T. stenantha*
- bb. Corolla cream suffused with maroon or rose in the throat, glabrous without; species of southern Brazil.
- c. Plants puberulent or hispidulous to glabrate; leaves ovate-elliptic; inflorescence relatively congested, dichotomous.....2. *T. stellaris*
- cc. Plants glabrous; leaves oblong-lanceolate; inflorescence repeatedly and irregularly di- or trichotomous, relatively lax.....3. *T. ornata*
- aa. Corolla infundibuliform, 5–6 cm. long, crimson-purple to rose; inflorescence obscurely dichotomous to essentially simple.....4. *T. violacea*

1. *Temnadenia stenantha* Woodson, Ann. Mo. Bot. Gard. 21: 613. 1934.

Stems relatively stout, minutely ferruginous-tomentulose when young, eventually becoming glabrate; leaves opposite, petiolate, oblong-elliptic, apex shortly acuminate, base broadly obtuse, 11–13 cm. long, 4.5–5.0 cm. broad, firmly membranaceous to subcoriaceous, glabrous above, beneath minutely and inconspicuously puberulent toward the base and otherwise glabrous; petioles 1.7–1.9 cm. long, minutely ferruginous-puberulent; inflorescence di- or trichotomous, bearing 20–25 rather mediocre, bright yellow flowers, minutely and irregularly ferruginous-tomentulose throughout, conspicuously surpassing the subtending leaves; pedicels 1.0–1.25 cm. long; bracts minutely lanceolate, 0.1–0.3 cm. long; calyx-lobes ovate-lanceolate, acute to acuminate, 0.35–0.53 cm. long, slightly foliaceous, minutely ferruginous-puberulent to -papillate without, the squamellae obscurely bifid; corolla salverform, minutely ferruginous-tomentulose without, the tube 2.5–2.7 cm. long, about 0.2 cm. in diameter at the base, slightly dilated toward the orifice, the lobes obliquely obovate-oblong, 1.0–1.1 cm. long, ascending or slightly spreading; stamens inserted somewhat below midway within the corolla-tube, the anthers elliptic-sagittate, 0.7–0.75 cm. long, densely villosulous-barbate dorsally; ovary ovoid-oblongoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries separate, slightly surpassing the ovary; follicles unknown.

COLOMBIA: BOYACA: on edge of high forest, region of Mt. Chapon, alt. 7000 ft., June 17, 1932, *Lawrance 241* (NY, TYPE, MBG, photograph and analytical drawings).

2. *Temnadenia stellaris* (Lindl.) Miers, Apoc. So. Am. 210. 1878.

*Echites stellaris* Lindl. Bot. Reg. 20: pl. 1664. 1835; A. DC. in DC. Prodr. 8: 457. 1844.

*Echites varia* Stadelm. Flora 24<sup>1</sup>: Beibl. 17. 1841; A. DC. loc. cit. 455. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 157. pl. 47. 1860.

*Echites Franciscea* A. DC. acc. to Lindl. Bot. Reg. n.s. 10: pl. 24. 1847, not A. DC. loc. cit. 452. 1844.



*Echites Franciscea* A. DC. var. *pallidiflora* Hook. f. Bot. Mag. 76: pl. 4547. 1850.

*Echites varia* Stadelm. a. *purpurea* Muell.-Arg. loc. cit. 158. 1860.

*Echites varia* Stadelm. b. *rosea* Muell.-Arg. loc. cit. 1860.

*Echites varia* Stadelm. c. *sulphurea* Muell.-Arg. loc. cit. 1860.

*Temnadenia bicrura* Miers, loc. cit. 208. 1878.

*Temnadenia pallidiflora* (Hook.) Miers, loc. cit. 211. 1878.

*Temnadenia Franciscea* (Lindl.) Miers, loc. cit. 212. 1878, not as to A. DC. loc. cit. 452. 1844.

Stems relatively slender, hispidulous to puberulent, eventually glabrate; leaves opposite, petiolate, ovate-elliptic, apex acuminate, base obtuse to rounded, 6–15 cm. long, 3–7 cm. broad, firmly membranaceous, above minutely bullate-strigillose to glabrate, beneath minutely puberulent; petioles 0.5–0.8 cm. long, puberulent; inflorescence dichotomous, usually equalling or somewhat surpassing the subtending leaves, softly puberulent throughout, bearing 10–30 congested, cream-colored flowers suffused with maroon in the tube and orifice; pedicels 0.8–1.0 cm. long, somewhat accrescent in fruit; bracts 0.2–1.0 cm. long, scarious to more or less foliaceous below; calyx-lobes ovate-lanceolate, acuminate, 0.4–0.6 cm. long, puberulent-papillate without, the squamellae deltoid, truncate, minutely lacerate; corolla salverform, glabrous without, the tube 1.5–2.0 cm. long, about 0.3 cm. in diameter at the base, sharply constricted at the insertion of the stamens, the lobes obliquely obovate, shortly acuminate, 1.0–1.4 cm. long, reflexed or spreading widely; stamens inserted about midway within the corolla-tube, the anthers lanceolate-sagittate, 0.6–0.65 cm. long, sparsely puberulent dorsally; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.15 cm. long; nectaries usually somewhat conerescent at the base, equalling or somewhat surpassing the ovary; follicles relatively stout, continuous, falcate, 12–16 cm. long, glabrous; seeds about 1.5 cm. long, the pale tawny coma about 0.2 cm. long.

BRAZIL: PERNAMBUCO: data incomplete, *Gardner 1060* (Camb.); MINAS GERAES: Pico d'Itabira, 1843, *Claussen 35* (MP, NY); RIO DE JANEIRO: Mage, date lacking,

*Miers 4020* (BM, US); SÃO PAULO: Santos, April 1, 1875, *Mosen 3020* (S); Cubatão, alt. 0-50 m., March 2, 1929, *Smith 2037* (G, MBG); PARANA: Tacarehy, in fruticetis, Febr. 11, 1915, *Dusen 16684* (MBG, S); Paranagua, ad marginem silvulae, March, 1914, *Jonsson 2a* (S); Rio Cubatão, ad marginem silvae fluminalis, Dec. 28, 1911, *Dusen 13696* (S); Porto Dom Pedro II, in insula in fruticetis, Febr. 25, 1911, *Dusen 11449* (MBG, S); Tacarehy, in silva primaeva ad marg. regionis lit., March 18, 1914, *Jonsson 91a* (S, US).

Several color forms are known of this species, which has been cultivated in Europe as a greenhouse or "stove" ornamental since prior to 1835 when it was illustrated and discussed in Edwards' Botanical Register 20: *pl. 1664*. The various color forms were interpreted subspecifically by Mueller, and later raised to specific rank by Miers. The species having been neglected horticulturally in recent years, it has been impossible to obtain first-hand knowledge of the color variation; and since herbarium specimens retain little by which they may be recognized, it has been considered best to retain the integrity of the species.

**3. *Temnadenia ornata* (Hoehne) Woodson, Ann. Mo. Bot. Gard. 19: 383. 1932.**

*Echites ornata* Hoehne, Comm. Linh. Electr. Estrat. Matto Grosso, Anexo 5, Bot. 6: 82. *pls. 120; 131, fig. 1*, 1915.

Stems relatively slender, glabrous; leaves opposite, shortly petiolate, oblong-lanceolate, apex abruptly acuminate, base obtuse, 8-12 cm. long, 3.5-4.5 cm. broad, glabrous, somewhat nitidulous above; petioles 0.4-0.5 cm. long; inflorescence repeatedly and rather irregularly di- or trichotomous, relatively lax, somewhat surpassing the subtending leaves, bearing 15-25 yellowish, crimson-flushed flowers, glabrous throughout; pedicels 1.0-1.2 cm. long; bracts lanceolate, 0.3-0.5 cm. long, somewhat foliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.3 cm. long, reflexed at the tips, slightly foliaceous, the squamellae deeply lacerate; corolla salverform, glabrous without, the tube 1.0-1.5 cm long, about 0.125 cm. in diameter at the base, somewhat dilating toward the orifice, the lobes obliquely obovate, 2.0-2.5 cm. long, acuminate, widely spreading or somewhat reflexed; stamens inserted about midway within the corolla-tube, the anthers 0.5 cm. long; carpels ovoid, about 0.125 cm. long,

glabrous; stigma 0.1 cm. long; nectaries separate, about half equalling the carpels; follicles unknown.

BRAZIL: MATTO GROSSO: Proecedencia Piruena, May, 1909, *Hoehne 1965* (B, isotype, MBG, photograph and analytical drawings).

4. *Temnadenia violacea* (Vell.) Miers, Apoc. So. Am. 208. 1878.

*Echites violacea* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 31. 1827; A. DC. in DC. Prodr. 8: 459. 1844; Stadelm. Flora 24<sup>1</sup>: Beibl. 34. 1841; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 158. pl. 50, fig. 3. 1860.

*Echites Maximiliana* Stadelm. loc. cit. 43. 1841.

*Echites Franciscea* A. DC. loc. cit. 452. 1844.

Stems relatively stout, densely hispidulous to glabrate; leaves opposite, petiolate, ovate-elliptic, acuminate, base obtuse to rounded, 7–10 cm. long, 3–6 cm. broad, firmly membranaceous, above densely and minutely bullate-hispidulous to glabrate, beneath densely puberulent; petioles 0.3–0.5 cm. long, puberulent; inflorescence somewhat surpassing the subtending leaves, softly puberulent without, bearing 4–9 congested, crimson-purple to deep rose-colored flowers; peduncle obscurely dichotomous to essentially simple; pedicels 1.0–1.2 cm. long, puberulent-papillate; bracts lanceolate, 0.5–0.8 cm. long, subfoliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.5–0.7 cm. long, irregularly puberulent without, the squamellae deeply lacerate; corolla infundibuliform, glabrous without, the proper-tube 1.5–1.7 cm. long, about 0.3 cm. in diameter at the base, slightly constricting toward the insertion of the stamens, the throat conical, 1.5–2.0 cm. long, about 0.8–1.0 cm. in diameter at the orifice, the lobes broadly and obliquely obovate, 1.5–2.0 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers 1 cm. long, minutely puberulent-papillate dorsally; ovary ovoid-oblongoid, about 0.4 cm. long; stigma 0.2 cm. long; nectaries essentially separate, about half equalling the ovary; follicles unknown.

BRAZIL: CEARA: Campo Grande, in carrascal, March 17, 1910, *Löfgren 282* (S); MINAS GERAES: ad Lagôa Santa, Jangada, in silva, date lacking, *Warming s.n.* (C); data incomplete, Aug.–April, 1840, *Claussen s.n.* (Camb.); RIO DE JANEIRO: ad Rio de Janeiro, June, 1866, *Engel s.n.* (C); SÃO PAULO: Santa Rita do Passa Quatro, Nov. 1, 1897, *Hemnendorff 36* (S); PARANA: Itarare, ad marg. silvulae, March 19,

1915, *Dusen* 16835 (S); Itarare, opp. Monengava, in campo cerrado, alt. 740 m., Jan. 26, 1915, *Dusen* 16808 (MBG); inter Senges et Fabio Rego, ad marg. silvulae, alt. 770 m., Dec. 11, 1910, *Dusen* 11038 (MBG, S, US).

## EXCLUDED SPECIES

*Temnadenia annularis* (L.f.) Miers, Apoc. So. Am. 216. 1878 (*Echites annularis* L.f. Suppl. 166. 1781) = **Prestonia annularis** (L.f.) G. Don, Gen. Hist. 4: 84. 1838.

*Temnadenia cordata* (A. DC.) Miers, Apoc. So. Am. 212. 1878 (*Echites cordata* A. DC. in DC. Prodr. 8: 451. 1844) = **Mandevilla oaxacana** (A. DC.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882 (*Echites Oaxacana* A. DC. loc. cit. 451. 1844).

*Temnadenia corrugulata* Miers, Apoc. So. Am. 215. 1878 = **Prestonia solanifolia** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 23: 282. 1936.

*Temnadenia glaucescens* (Mart. & Gal.) Miers, Apoc. So. Am. 214. 1878 (*Echites glaucescens* Mart. & Gal. Acad. Roy. Brux. 11<sup>1</sup>: 358. 1844) = **Mandevilla oaxacana** (A. DC.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882 (*Echites Oaxacana* A. DC. in DC. Prodr. 8: 451. 1844).

*Temnadenia lasiocarpa* Miers, Apoc. So. Am. 210. 1878 (*Echites lasiocarpa* A. DC. in DC. Prodr. 8: 463. 1844) = **Mandevilla lasiocarpa** (A. DC.) Malme, Bihang till K. Sv. Vet. Akad. Handl. Afd. III. 24<sup>10</sup>: 25. 1899.

*Temnadenia leptoloba* (Stadelm.) Miers, Apoc. So. Am. 211. 1878 (*Echites leptoloba* Stadelm. Flora 24<sup>1</sup>: Beibl. 15. 1841) = **Prestonia agglutinata** (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931 (*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760).

*Temnadenia Lobbiana* (A. DC.) Miers, Apoc. So. Am. 209. 1878 (*Echites lasiocarpa* A. DC. γ *Lobbiana* A. DC. in DC. Prodr. 8: 464. 1844) = **Mandevilla lasiocarpa** (A. DC.) Malme, Bihang till K. Sv. Vet. Akad. Handl. Afd. III. 24<sup>10</sup>: 25. 1899 (*Echites lasiocarpa* A. DC. loc. cit. 463. 1844).

*Temnadenia palustris* (Muell.-Arg.) Miers, Apoc. So. Am. 213. 1878 (*Amblyanthera palustris* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 145. 1860) = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hir-*

*hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792, not R. & P.).

*Temnadenia parviflora* (Benth.) Miers, Apoc. So. Am. 215. 1878 (*Haemadictyon parviflorum* Benth. Pl. Hartw. 355. 1857) = **Prestonia parviflora** Benth. in Benth. & Hook. Gen. Pl. 2: 709. 1873.

*Temnadenia quinquangularis* (Jacq.) Miers, Apoc. So. Am. 217. 1878 (*Echites quinquangularis* Jacq. Enum. Pl. Carib. 13. 1760) = **Prestoria quinquangularis** (Jacq.) Spreng. Syst. 1: 637. 1825.

*Temnadenia Riedelii* (Muell.-Arg.) Miers, Apoc. So. Am. 216. 1878 (*Haemadictyon Riedelii* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 170. 1860) = **Prestonia Riedelii** (Muell.-Arg.) Mgf. in Fedde, Rep. Spec. Nov. 20: 26. 1924.

*Temnadenia secundiflora* (A. DC.) Miers, Apoc. So. Am. 211. 1878 (*Echites secundiflora* A. DC. in DC. Prodr. 8: 457. 1844) = **Mandevilla subsagittata** (R. & P.) Woodson, Ann. Mo. Bot. Gard. 19: 69. 1932 (*Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799).

*Temnadenia semidigyna* (Berg) Miers, Apoc. So. Am. 213. 1878 (*Echites semidigyna* Berg, Abh. Zeeuwsch Gen. Wetens. 3: 583. 1773). This appears to be an unidentifiable species of *Tabernaemontana*.

*Temnadenia solanifolia* (Muell.-Arg.) Miers, Apoc. So. Am. 214. 1878 (*Haemadictyon* (?) *solanifolium* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 171. pl. 49. 1860) = **Prestonia solanifolia** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 23: 282. 1936.

*Temnadenia tenuicula* Miers, Apoc. So. Am. 216. 1878 = **Prestonia solanifolia** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 23: 282. 1936 (*Haemadictyon* (?) *solanifolium* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 171. pl. 49. 1860).

*Temnadenia tomentosa* (Vahl) Miers, Apoc. So. Am. 213. 1878 (*Echites tomentosa* Vahl, Symb. Bot. 3: 44. 1794) = **Mandevilla hirsuta** (A. Rich.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895 (*Echites hirsuta* A. Rich. Actes Soc. Hist. Nat. Paris 1: 107. 1792, not R. & P.).

*Temnadenia xanthostoma* (Stadelm.) Miers, Apoc. So. Am.



212. 1878 (*Echites xanthostoma* Stadelm. Flora 24<sup>1</sup>: Beibl. 55. 1841) = *Mandevilla coccinea* (Hook. & Arn.) Woodson, Ann. Mo. Bot. Gard. 20: 734. 1933 (*Echites coccinea* Hook. & Arn. in Hook. Jour. Bot. 1: 286. 1834).

## XXII. FERNALDIA Woodson

**Fernaldia** Woodson, Ann. Mo. Bot. Gard. 19: 48. 1932.

Lactescent, fruticose or suffruticose lianas. Stems volubile, terete; branches alternate, or opposite below. Leaves opposite, petiolate, entire, penninerved, eglandular; petioles subtended by several minute, pectinate, adaxial stipular appendages. Inflorescence lateral, alternate, simply scorpioid, bearing several rather showy, white flowers. Calyx 5-parted, the lobes equal to subequal, cleft nearly to the receptacle, imbricated, scarious or only very slightly foliaceous, bearing solitary opposite squamellae within at the base. Corolla infundibuliform, slightly gibbous to essentially straight, the tube exappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute, more or less arachnoid-villous within. Stamens 5, included, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged obtusely 2-auriculate, peltate connective; pollen granular. Carpels 2, united at the apex by a slender stylar shaft surmounted by the fusiform-capitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries concrescent, unequally 4-lobed. Follicles 2, apocarpous, terete, acuminate, dehiscing along the ventral suture, containing many dry, truncate, apically comose seeds.

Type species: *Fernaldia pandurata* (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 48. 1932.

### KEY TO THE SPECIES

- a. Corolla glabrous without, or essentially so, or the lobes occasionally ciliate without, the proper-tube 2.0–2.2 cm. long, about 0.15 cm. in diameter at the base, somewhat gibbous at the insertion of the stamens, the throat broadly campanulate-conical, 0.9–1.2 cm. long.....1. *F. pandurata*
- aa. Corolla generally pilosulose without, the proper-tube 1.8–2.0 cm. long, about 0.3 cm. in diameter at the base, scarcely gibbous, the throat rather narrowly conical, 1.6–1.8 cm. long.....2. *F. brachypharynx*



1. *Fernaldia pandurata* (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 48. 1932.

*Echites pandurata* A. DC. in DC. Prodr. 8: 458. 1844.

*Urechites Karwinskii* Muell.-Arg. Linnaea 30: 440. 1860;  
Miers, Apoc. So. Am. 125. 1878.

*Amblyanthera ? pandurata* (A. DC.) Muell.-Arg. loc. cit.  
448. 1860.

*Angadenia pandurata* (A. DC.) Miers, loc. cit. 182. 1878.

*Mandevilla velutina* K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 171. 1895, not Woodson.

*Mandevillea potosina* T. S. Brandg. Univ. Calif. Publ. Bot.  
4: 276. 1912.

*Echites pinguifolia* Standl. Field Mus. Publ. Bot. 8: 35.  
1930.

#### Plate 5.

Stems relatively slender, densely puberulent to essentially glabrate; leaves opposite, oblong-elliptic to broadly ovate, apex shortly acuminate, the lower usually broadly cordate, the upper merely obtuse to subtruncate at the base, 4–13 cm. long, 1.5–8.0 cm. broad, membranaceous, either surface densely puberulent to velutinous, or the upper essentially glabrate; petioles 1–2 cm. long, minutely puberulent to essentially glabrate; inflorescence lateral, simply scorpioid, bearing 6–18 rather showy, white to pale greenish-yellow flowers, the peduncle usually about half equalling the subtending leaves, minutely puberulent; pedicels 0.4–0.6 cm. long, minutely puberulent, congested toward the upper half of the peduncle; bracts ovate, acute to acuminate, scarious or only slightly foliaceous, 0.1–0.2 cm. long; calyxlobes ovate, acute to obtuse, 0.2–0.3 cm. long, minutely puberulent to puberulent-papillate without, the squamellae very minutely crenulate or erose; corolla infundibuliform, essentially glabrous without, or the lobes more or less ciliate, the proper-tube 2.0–2.2 cm. long, about 0.15 cm. in diameter at the base, somewhat gibbous or arcuate at the insertion of the stamens, the throat broadly campanulate-conical, 0.9–1.2 cm. long, 0.7–0.9 cm. in diameter at the orifice, the lobes obliquely obovate, acute to acuminate, 1.0–1.3 cm. long, densely arachnoid-villous

at the base within, the margins occasionally ciliate, patulous; stamens inserted at the base of the corolla-throat, the anthers broadly elliptic-sagittate, shortly and rather obtusely auriculate, 0.6–0.65 cm. long, glabrous; ovary ovoid-oblongoid, about 0.2 cm. long, glabrous; stigma 0.2 cm. long; nectaries unequally 4-lobed, only slightly fleshy, about half equalling the ovary; mature follicles unknown.

MEXICO: TAMAULIPAS: El Rosario, vicinity of Marmolejo, alt. 2100 ft., Aug. 10, 1930, *Bartlett 10873* (US); SAN LUIS POTOSI: Raseon, Aug., 1911, *Purpus 5408* (MBG, NY); VERA CRUZ: Baños del Carrizal, Aug., 1912, *Purpus 6232* (MBG, US); GUERRERO: Acapulco and vicinity, Oct., 1894–March, 1895, *Palmer 259* (G, US); OAXACA: Cafetal Las Pitas, alt. 400 m., Oct. 10, 1917, *Ekeo 3511* (US); YUCATAN: Izamal, 1895, *Gaumer 815* (MBG).

EL SALVADOR: San Salvador, alt. 657 m., date lacking, *Laboratorio Químico 2* (MBG, US); cultivated, vicinity of San Salvador, alt. 650–850 m., March 30–April 24, 1922, *Standley 23542* (NY, US).

Also reported from Costa Rica. The lowermost leaves are said to be more or less pandurate in outline. The popular name of the species is reported as “loroco,” or “floroco,” and the flowers are said by Standley to be used as a flavoring for rice. Notes on the label of the specimen from the chemical laboratory of the argicultural department of El Salvador state: “Flores en la estacion lluviosa. Flores comestibles despues de cociamiento. Muy apreciadas por su olor y sabor en la comida. Abunda en los mercados.”

**2. *Fernaldia brachypharynx* Woodson, Ann. Mo. Bot. Gard. 19: 380. 1932.**

Stems relatively slender, minutely puberulent to glabrate when fully mature; leaves opposite, petiolate, broadly ovate, shortly and abruptly acuminate, base broadly rounded, 7–10 cm. long, 5–7 cm. broad, membranaceous, above densely hispidulous to very minutely puberulent-papillate, beneath velutinous to rather minutely puberulent; petioles 0.9–2.0 cm. long, pilosulose; inflorescence lateral, simply scorpioid, the peduncle much shorter than the subtending leaves, minutely puberulent; pedicels 0.4–0.5 cm. long, minutely puberulent, congested toward the upper half of the peduncle; bracts ovate, 0.1–0.2 cm. long; calyx-lobes ovate, acuminate, 0.2–0.3

cm. long, minutely and sparsely pilosulose without, the squamellae deltoid, minutely crenulate; corolla infundibuliform, generally pilosulose without, the proper-tube 1.8–2.0 cm. long, about 0.3 cm. in diameter at the base, the throat rather narrowly conical, 1.6–1.8 cm. long, about 0.7 cm. in diameter at the orifice, the lobes obliquely obovate, acuminate, 1.2–1.4 cm. long, arachnoid-villous at the base within, patulous; stamens inserted at the base of the corolla-throat, the anthers elliptic-sagittate, shortly and rather obtusely auriculate, 0.6 cm. long, glabrous; ovary ovoid-oblongoid, about 0.15 cm. long, glabrous; stigma 0.2 cm. long; nectary irregularly 4-lobed, only slightly fleshy, about half equalling the ovary; follicles unknown.

GUATEMALA: ESCUINTLA: along the road from Escuintla to the port of San Jose de Guatemala, Aug. 23, 1860, *Hayes s.n.* (G, TYPE, MBG, photograph and analytical drawings); Villa Nueva, Sept., 1914, *Tejada 249* (US).

### XXIII. ASKETANTHERA Woodson

**Asketanthera** Woodson, Ann. Mo. Bot. Gard. 19: 46. 1932.

*Echites* of authors, in part, not P. Br.

Lactescent, suffruticose or suffrutescent lianas. Stems volubile, terete; branches mostly opposite below, becoming alternate above. Leaves opposite, petiolate, entire, penninerved, eglandular; petioles subtended by several minute, pectinate, adaxial, stipular appendages. Inflorescence lateral, alternate, simply scorpioid, bearing several showy, pedicellate flowers subtended by conspicuously foliaceous bracts. Calyx 5-parted, the lobes subequal, cleft nearly to the receptacle, imbricated, strikingly foliaceous, bearing solitary, opposite squamellae within at the base. Corolla salverform, the tube straight, ex-appendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, included, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged, sagittate, narrowly 2-auriculate connective; pollen granular. Carpels 2, united at the apex by a slender stylar shaft surmounted by the fusiform-capitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta.

Nectaries 5, separate or somewhat concrescent at the base. Follicles 2, apocarpous, terete, dehiscent along the ventral suture, containing many dry, rostrate, apically comose seeds.

Type species: *Asketanthera calycosa* (A. Rich.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

#### KEY TO THE SPECIES

- a. Stamens inserted about midway within the corolla-tube, the anthers barely included; plants of Cuba.....1. *A. calycosa*
- aa. Stamens inserted near the base of the corolla-tube, the anthers deeply included; species of Hispaniola.
  - b. Corolla 2-5 cm. long; inflorescence 8-20-flowered.
    - c. Corolla 2.0-2.5 cm. long, the tube somewhat shorter than the calyx-lobes, essentially glabrous without.....2. *A. Picardae*
    - cc. Corolla 4-5 cm. long, the tube conspicuously surpassing the calyx-lobes, hispidulous without.....3. *A. dolichopetala*
  - bb. Corolla 13-16 cm. long; inflorescence 2-8-flowered.....4. *A. Ekmaniana*

1. *Asketanthera calycosa* (A. Rich.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

*Echites calycosa* A. Rich. in Sagra, Hist. Cuba 11: 94. 1850.

*Rhodocalyx calycosus* (A. Rich.) Miers, Apoc. So. Am. 140. 1878.

*Echites Rugeliana* Urb. Symb. Ant. 5: 465. 1908.

#### Plate 6.

Stems relatively stout, densely ferruginous-hispidulous to glabrate. Leaves opposite, petiolate, broadly ovate-elliptic, apex acuminate, base obtuse to rounded, 8-15 cm. long, 5-9 cm. broad, membranaceous, above minutely strigillose to glabrate, beneath densely puberulent-pilosulose; petioles 0.7-1.0 cm. long, densely puberulent-pilosulose; inflorescence corymbose, bearing 5-12 congested, pale greenish-white or yellowish flowers; peduncle somewhat shorter than the subtending leaves, hispidulous; pedicels 1.0-1.5 cm. long, densely hispidulous; bracts lanceolate, conspicuously foliaceous, 1.2-2.0 cm. long; calyx-lobes elliptic-lanceolate, acuminate, 1-2 cm. long, conspicuously foliaceous, rather sparsely pilose, the squamellae deltoid, truncate, essentially entire; corolla salverform, rather sparsely pilosulose without, the tube 1.0-1.3 cm. long, about 0.2

cm. in diameter at the base, the lobes obliquely elliptic-ob lanceolate, acute, 3.0–4.5 cm. long, patulous; stamens inserted about midway within the corolla-tube, the anthers narrowly lanceolate-sagittate, 0.8 cm. long, glabrous; ovary ovoid, about 0.3 cm. long, glabrous; stigma 0.2 cm. long; nectaries about half equalling the ovary; follicles relatively stout, continuous, acuminate, 25–30 cm. long, densely ferruginous-hispid; seeds 1.6–1.9 cm. long, the pale tawny coma 3.0–3.5 cm. long.

CUBA: PINAR DEL RIO: Sierra de los Organos, grupo del Rosario, valley of Rio Santa Cruz, March 31, 1923, *Ekman 16390* (S); HABANA: Sierra Anafe, in the part of the Sierra called "Loma Esperon," in one of the deep clefts, July 11, 1921, *Ekman 13037* (S); ORIENTE: Sierra de Nipe, in marracales at Rio Barigua, Sept. 30, 1922, *Ekman 15311* (S); Baracoa, in vall. flumin. Rio Macaguanigua, Jan. 19, 1915, *Ekman 4340* (S); Sierra Maestra, El Peru, rocky gulch of Arroyo del Peru, Aug. 8, 1922, *Ekman 16409* (B, S); Sierra de Nipe, "El Taller," ad Rio Piloto, Febr. 18, 1918, *Ekman 9051* (S); Bayamon, alt. 500 m., Febr., 1889, *Eggers 4707* (B, US); data incomplete, *Wright 1377* (B, Bx, K, MBG); MATANZAS [?]: ad fluv. San Juan, date lacking, *Rugel 397* (B).

*Echites Rugeliana* Urb. differs from *E. calycosa* A. Rich. only in the somewhat larger calyx and corolla, a character which is rendered insignificant by great variability. Extreme specimens of either are found on the same herbarium sheet of *Wright 1377* in the herbarium of the Missouri Botanical Garden.

2. *Asketanthera Picardae* (Urb.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

*Echites Picardae* Urb. Symb. Ant. 5: 466. 1908.

Stems relatively slender, minutely ferruginous-puberulent to glabrate; leaves opposite, petiolate, ovate-elliptic, apex acuminate, base obtuse, 8–15 cm. long, 3–9 cm. broad, delicately membranaceous, above minutely strigillose to glabrate, beneath very minutely puberulent to glabrate; petioles 0.7–1.0 cm. long, minutely puberulent; inflorescence corymbose, bearing 8–20 greenish-yellow flowers; peduncle about half equalling the subtending leaves, minutely ferruginous-puberulent; pedicels 0.5–0.8 cm. long, minutely ferruginous-puberulent; bracts elliptic-lanceolate, acute to acuminate, 1.5–2.0 cm. long, conspicuously foliaceous; corolla salverform, essentially glabrous without, the tube 1.2–1.5 cm. long, about 0.1 cm. in diameter at



the base, the lobes obliquely obovate-oblong, acute, 0.8–1.0 cm. long, patulous; stamens inserted near the base of the corollatube, the anthers narrowly lanceolate, sagittate, 0.7 cm. long, glabrous; ovary oblongoid, about 0.2 cm. long, glabrous; nectaries about half equalling the ovary; follicles continuous, acuminate, 30–45 cm. long, glabrous; seeds 1.7 cm. long, the pale tawny coma 4 cm. long.

**HISPANTOLA:** HAITI: in montibus prope Pétionville, alt. 400 m., July 17, 1891, *Picarda 304* (B); Pte. Rivière des Nippes, hillside at Bellevue, alt. 500 m., July 16, 1927, *Ekman 8590* (B, S, US); Presqu'île de Nord-ouest, montagnes de Terre-neuve, Gros Morne, limestone precipices, alt. 400 m., Oct. 10, 1925, *Ekman 5053* (B, S); Massif de la Hotte, eastern group, Aquin, La Colline, in Morne des Abricots, alt. 500 m., Nov. 9, 1926, *Ekman 7191* (B); Massif de la Hotte, eastern group, Miragoane, limestone cliffs south of Étang-Miragoane, July 28, 1926, *Ekman 6536* (B, S); Presqu'île du Nord-ouest, Les Gonaïves, between Bassin and Mémé, alt. 350 m., Dec. 24, 1927, *Ekman 9460* (B, S); Basse Vallée de Siburon, Sept. 2, 1910, *Christ 2279* (B); prope Bel Endroit, in fruticosis densis, Aug. 9, 1917, *Ekman 659* (B, S).

**3. *Asketanthera dolichopetala* (Urb.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.**

*Echites dolichopetala* Urb. Symb. Ant. 7: 335. 1912.

Stems relatively stout, densely and minutely ferruginous-hispidulous to glabrate; leaves opposite, petiolate, ovate-elliptic, apex abruptly acuminate, base rather abruptly obtuse, 6–10 cm. long, 4–6 cm. broad, above densely strigillose-hispidulous, beneath densely and minutely pilosulose; petioles 1.5–2.0 cm. long, densely and minutely hispidulous; inflorescence corymbose, bearing 8–12 congested greenish cream-colored flowers; peduncle about equalling or somewhat surpassing the subtending leaves, minutely and densely ferruginous-puberulent; pedicels 0.5–0.8 cm. long, minutely ferruginous-puberulent; bracts broadly lanceolate, 1.0–1.5 cm. long, conspicuously foliaceous; calyx-lobes broadly lanceolate, acuminate, 1.2–1.7 cm. long, conspicuously foliaceous, pilosulose, the squamellae deltoid, deeply lacerate; corolla salverform, densely ferruginous-hispidulous without, the tube 1.5–2.2 cm. long, about 0.2 cm. in diameter at the base, the lobes obliquely obovate-lanceolate, acute, 2.5–2.7 cm. long, patulous; stamens inserted near the base of the corolla-tube, the anthers broadly elliptic-



sagittate, 0.7 cm. long, glabrous; ovary ovoid, about 0.2 cm. long; nectaries somewhat shorter than the ovary; follicles unknown.

HISPANIOLA: SANTO DOMINGO: Barahona, in via ad El Marviel, alt. 100 m., July, 1910, *Fuertes 453* (B, BM, K, MBG, S); data incomplete, *Martin s.n.* (DL).

A species offering a striking similarity in superficial aspect to *A. calycosa* of Cuba, but differing in the deeper insertion of the stamens, the harsher indument, and the deeply lacerate squamellae.

**4. *Asketanthera Ekmaniana* Woodson, nom. nov.**

*Echites longiflora* Ekm. & Helwig, Arkiv f. Bot. **22A**<sup>10</sup>: 45. 1929, not Desf.

*Asketanthera longiflora* (Ekm. & Helwig) Woodson, Ann. Mo. Bot. Gard. **19**: 47. 1932.

Stems relatively slender, very minutely puberulent to glabrate; leaves opposite, petiolate, ovate to broadly elliptic-lanceolate, apex acuminate, base obtuse, 9–14 cm. long, 4–8 cm. broad, delicately membranaceous, above essentially glabrous, beneath very minutely puberulent-papillate to glabrate; petioles 0.5–0.8 cm. long, minutely puberulent-papillate; inflorescence corymbose, bearing 2–8 very showy, greenish-white or cream-colored flowers; peduncle about half equalling the subtending leaves, glabrate; pedicels 1.0–1.2 cm. long, essentially glabrous; bracts broadly elliptic-lanceolate, 1.5–2.0 cm. long, conspicuously foliaceous; calyx-lobes broadly elliptic-lanceolate, acuminate, 2.0–2.5 cm. long, conspicuously foliaceous; corolla salverform, glabrous without, the tube 7–8 cm. long, about 0.2 cm. in diameter at the base, the lobes obliquely elliptic-lanceolate, 6–8 cm. long, patulous; stamens inserted near the base of the corolla-tube, the anthers narrowly oblong-sagittate, 0.8–1.0 cm. long, glabrous; ovary oblongoid, about 0.3 cm. long, glabrous; nectaries somewhat conerescent at the base, about one-third equalling the ovary; mature follicles unknown.

HISPANIOLA: HAITI: eastern La Hotte, Chapelle Mont Carmel, in a gulch, Nov. 8, 1924, *Ekman 2426* (S); Massif de la Hotte, eastern group, Pte. Gonave, near Chap. St.-Michel, deep limestone hill, date lacking, *Ekman 6598* (B, S); SANTO

DOMINGO: Cordillera de Barahona, Sierra de los Comisarios, between Banane and Gros Figuier, limestone, alt. 500 m., Aug. 28, 1926, *Ekman 6762* (B, S).

A most remarkable plant, which seems to be a fairly free bloomer, and certainly appears to be a worthy subject for cultivation in greenhouses.

#### XXIV. MACROPHARYNX Rusby

**Macropharynx** Rusby, Mem. N. Y. Bot. Gard. 7: 327. pl. 6. 1927.

Lactescent, fruticose lianas. Stems volubile, terete; branches opposite. Leaves opposite, petiolate, entire, penninerved, eglandular; petioles subtended by several minute, adaxial, pectinate, stipular appendages. Inflorescence lateral, opposite or infrequently alternate, an extremely condensed, subumbellate cincinnus, conspicuously bracteate, bearing few to several showy, greenish-white flowers. Calyx 7-9-parted (or 5-parted ?), the lobes somewhat unequal, more or less foliaceous, imbricated, cleft nearly to the receptacle, bearing within at the base a solitary, opposite squamella. Corolla infundibuliform (or salverform ?), the tube straight, exappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens, 5, included, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged, narrowly sagittate, acutely 2-auriculate connective; pollen granular. Carpels 2, united at the apex by a slender stylar shaft surmounted by the fusiform stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or somewhat concrescent at the base. Follicles 2, apocarpous, terete, dehiscing along the ventral suture, containing many dry, comose seeds.

Type species: *Macropharynx spectabilis* (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

#### KEY TO THE SPECIES

- a. Corolla infundibuliform to subsalverform; calyx-lobes 7-9, immediately subtended by similar bracts.....1. *M. spectabilis*
- aa. Corolla salverform; calyx-lobes 5, not immediately subtended by bracts....  
.....2. *M. anomala*

1. *Macropharynx spectabilis* (Stadelm.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

*Echites spectabilis* Stadelm. Flora 24<sup>1</sup>: Beibl. 44. 1841;  
A. DC. in DC. Prodr. 8: 462. 1844; Muell.-Arg. in Mart.  
Fl. Bras. 6<sup>1</sup>: 153. 1860.

*Elytropus spectabilis* (Stadelm.) Miers, Apoc. So. Am.  
116. 1878.

*Macropharynx fistulosa* Rusby, Mem. N. Y. Bot. Gard. 7:  
329. pl. 6. 1927.

Stems stout, densely and minutely ferruginous-tomentulose when young, eventually becoming glabrate; leaves opposite, petiolate, broadly ovate, apex very shortly and abruptly acuminate, base rounded to broadly and rather obscurely cordate, 9-30 cm. long, 5-17 cm. broad, firmly membranaceous to subcoriaceous, above minutely ferruginous-puberulent when young, glabrate and rather lustrous when fully mature, beneath minutely ferruginous-pilosulose to glabrate; petioles 3-5 cm. long, indument as upon the stem; inflorescence lateral, usually opposite, subumbellate, bearing 1-5 showy, greenish-white flowers; peduncle extremely condensed, about half equalling the subtending petioles, minutely ferruginous-puberulent; bracts linear, 0.4-1.2 cm. long, subfoliaceous, usually ferruginous-pilosulose; calyx-lobes 7-9, linear, long-acuminate, 0.9-1.3 cm. long, ferruginous-puberulent or -pilosulose without, subfoliaceous, the squamellae minutely lacerate; corolla infundibuliform or subsalverform, glabrous without, or essentially so, the proper-tube 0.7-1.0 cm. long, about 0.2-0.3 cm. in diameter at the base, the throat subtubular, 1.3-4.0 cm. long, about 0.4-0.8 cm. in diameter at the orifice, the lobes obliquely obovate, 1.2-1.7 cm. long, patulous; stamens inserted at the base of the corolla-throat, the anthers narrowly sagittate, 0.9-1.0 cm. long, glabrous; ovary ovoid-oblongoid, about 0.3 cm. long, minutely puberulent-papillate to essentially glabrous; stigma 0.2 cm. long; nectaries equalling to somewhat surpassing the ovary; follicles relatively stout, 22-25 cm. long, ferruginous-hispidulous when young, eventually glabrate; seeds unknown.

BRAZIL: PARA: Belem, ad marginem silvae prope lacum Catu, Jan. 1, 1926, Ducke 21586 (B, US); AMAZONAS: in silvis ad Manacuru, ditionis Japurensis, 1920,

*Martius s.n.* (B, TYPE); schlingend in den Hugelwaldchen von Porongo bei Santa Cruz, Jan. 1911, *Herzog 1512* (B).

PERU: LORETO: Stromgebiet des Maranon von Jquitos aufwrts bis zur Santiago-Mndung am Pongo de Manseriche, June 23, 1924, *Tessmann 3607* (B); Iquitos, woods, alt. about 100 m., Aug. 3-11, 1929, *Kllip & Smith 27493* (MBG, NY, US); Mishuyacu, near Iquitos, forest, alt. 100 m., Oct.-Nov., 1929, *Klug 541* (NY, US).

BOLIVIA: BENI: Rurrenabaque, alt. 1000 ft., Dec. 1, 1921, *Cardenas 1894* (K, NY, US); LA PAZ: San Carlos bei Sarompiuni, alt. 600 m., Dec. 21, 1926, *Buchtien 1743* (NY); SANTA CRUZ: Rio Surutu, Prov. Sara, Dec. 27, 1924, *Steinbach 6813* (B, K, MBG); Banados del Piray, Buenaventura, alt. 450 m., May, 1915, *Lillo 1314* (B); Pamparegion de Buenavista, Prov. del Zara, alt. 400 m., Dec. 23, 1916, *Lillo 3300* (B).

Steinbach reports "No hace randaes, porque ramifera poco." It is a great temptation to segregate the specimens cited above into two, or perhaps three species or varieties based upon discrepancies in the size of the corolla, and on the indument of the inflorescence. The flora of the region from which they come is so inadequately understood, however, that it is believed more practical to preserve the integrity of the species for the present. In the herbarium at Berlin-Dahlem there is a specimen, supposedly of this same species, bearing the data "in silvis pr. Paramaribo," without date, collected by Kegel (174). The data has appeared too dubious to incorporate with the better substantiated range records in the Amazon valley.

**2. *Macropharynx* [?] *anomala* Woodson, Ann. Mo. Bot. Gard. 21: 614. 1934.**

Stems relatively slender, minutely and densely ferruginous-tomentulose to glabrate; leaves opposite, petiolate, broadly ovate, apex shortly and narrowly subcaudate-acuminate, base broadly obtuse to rounded, frequently rather obscurely cordate, 10-18 cm. long, 5-9 cm. broad, membranaceous, above rather irregularly ferruginous-puberulent to -papillate, beneath densely and very minutely ferruginous-tomentulose; petioles 2.5-3.0 cm. long, minutely ferruginous-tomentulose; inflorescence lateral, opposite, subumbellate-fasciculate, relatively few-flowered; peduncle minutely ferruginous-tomentulose, somewhat shorter than the subtending petioles; pedicels 0.15-0.2 cm. long, minutely ferruginous-tomentulose; bracts linear, 1.0-1.4 cm. long, somewhat foliaceous, minutely pilosu-

lose to puberulent-papillate; calyx-lobes 5, narrowly elliptic-lanceolate, 1.7–1.8 cm. long, somewhat foliaceous, minutely puberulent-papillate, the squamellae deltoid, minutely denticulate; corolla salverform, minutely puberulent-papillate without, the tube (in well-formed buds) 1.4–1.6 cm. long, about 0.2 cm. in diameter at the base, somewhat inflated at the insertion of the stamens thence gradually constricting toward the orifice, the lobes rather narrowly ovate-dolabriform, acuminate, 0.9–1.0 cm. long, patulous; stamens inserted near the base of the corolla-tube, the anthers included, narrowly sagittate, 0.7–0.72 cm. long, minutely papillate to essentially glabrous dorsally; ovary oblongoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries slightly surpassing the ovary; follicles unknown.

ECUADOR: in silv. tropic. fl. Pilaton, Oct., 1902, *Sodiro 107/16* (B, TYPE, MBG, photograph and analytical drawings).

A discussion of reasons for and against relegating this plant to *Macropharynx* will be found at the place of original publication.

#### XXV. THENARDIA HBK.

*Thenardia* HBK. Nov. Gen. 3: 209. 1819; A. DC. in DC. Prodr. 8: 425. 1844; Benth. & Hook. Gen. Pl. 2: 710. 1876; Miers, Apoc. So. Am. 242. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 187. 1895, not Sesse & Mociño.

Lactescent, suffruticose or suffrutescent lianas. Stems terete; branches alternate, or occasionally opposite, particularly below. Leaves opposite, petiolate, entire, penninerved, eglandular, the petioles subtended by a solitary, adaxial, stipular appendage. Inflorescence a lateral, alternate, pedunculate, trichotomous, umbellate cyme, the ultimate branches extremely compressed, inconspicuously bracteate. Calyx 5-parted, the lobes equal or essentially so, cleft nearly to the receptacle imbricated, subtended by solitary, opposite squamellae. Corolla rotate to shortly salverform, the tube straight, exappendiculate within, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers connivent and ag-



glutinated to the stigma, consisting of 2 parallel sporangia borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective, widely exserted; filaments connate above; pollen granular. Carpels 2, united at the apex by a common stylar shaft surmounted by the fusiform-capitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, essentially separate, or somewhat concrescent at the base. Follicles 2, apocarpous, terete, dehiscing along the ventral suture, containing many dry, apically comose seeds (fide A. de Candolle).

Type species: *Thenardia floribunda* HBK. Nov. Gen. 3: 210. pl. 240. 1819.

#### KEY TO THE SPECIES

- a. Corolla relatively large and showy, the limb 2.0–2.8 cm. in diameter, the tube not sharply constricted at the insertion of the stamens.
  - b. Corolla shortly salverform, the tube 0.5–0.6 cm. long, the lobes 0.7–0.8 cm. long.....1. *Th. tubulifera*
  - bb. Corolla rotate, the tube 0.2–0.35 cm. long, the lobes 1.0–1.3 cm. long.....2. *Th. floribunda*
- aa. Corolla relatively small, the limb 1.2–1.5 cm. in diameter, the tube sharply constricted at the insertion of the stamens.
  - b. Corolla-lobes obtuse; squamellae narrowly oblong-trigonal, entire; nectaries about half equalling the ovary.....3. *Th. gonoloboides*
  - bb. Corolla-lobes acute; squamellae broadly oblong-dentiform, minutely erose; nectaries equalling or slightly surpassing the ovary.....4. *Th. Galeottiana*

#### 1. *Thenardia tubulifera* Woodson, Ann. Mo. Bot. Gard. 19: 381. 1932.

Stems relatively slender, glabrous; leaves opposite, shortly petiolate, elliptic-lanceolate, apex subcaudate-acuminate, base obtuse, 4–9 cm. long, 1.5–3.0 cm. broad, membranaceous, glabrous above, sparsely pilosulose along the midrib and veins beneath; petioles 0.5–1.0 cm. long, sparsely pilosulose to glabrate; inflorescence equalling or somewhat surpassing the leaves, multiflorous; primary peduncle 2.5–3.0 cm. long, the secondary 0.5–0.8 cm. long; pedicels 2.5–2.7 cm. long, puberulent-papillate to essentially glabrous; bracts lanceolate, about 0.1–0.2 cm. long; calyx-lobes ovate-lanceolate, acuminate, 0.2–0.3 cm. long, essentially glabrous without, the squamellae deltiform, es-



mentally entire; corolla shortly salverform, glabrous without, the tube broadly cylindrical, 0.5–0.6 cm. long, about 0.2 cm. in diameter at the base, about 0.3 cm. in diameter at the orifice, slightly and gradually constricted somewhat above midway at the insertion of the stamens, the lobes obliquely obovate-orbicular, minutely apiculate, 0.7–0.8 cm. long, spreading; stamens barely exerted, the anthers 0.7–0.8 cm. long, the filaments 0.35–0.4 cm. long, minutely puberulent-papillate above; ovary ovoid, about 0.15 cm. long, glabrous; nectaries somewhat shorter than the ovary, essentially separate; stigma 0.125 cm. long; follicles unknown.

MEXICO: JALISCO: data incomplete, *Diquet s.n.* (NY, TYPE, US, MBG, photograph and analytical drawings); Tonila, alt. 1000 m., Sept., 1923, *Reko 4823* (US).

Reko reports his specimen as bearing pink, fragrant flowers, which evidently applies to the following species as well:

2. *Thenardia floribunda* HBK. Nov. Gen. 3: 210. *pl.* 240. 1819; A. DC. in DC. Prodr. 8: 425. 1844; Miers, Apoc. So. Am. 242. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895.

*Thenardia ? suaveolens* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 359. 1844.

Stems relatively slender, glabrous; leaves opposite, or rarely ternate, petiolate, oblong-elliptic, apex acutely subcaudate-acuminate, base obtuse, 5.5–13.0 cm. long, 2–5 cm. broad, delicately membranaceous, wholly glabrous or merely sparsely pilosulose at the base of the midrib beneath; petioles 0.8–1.5 cm. long, glabrous; inflorescence about equalling or somewhat surpassing the subtending leaves, multiflorous; primary peduncle 2.5–8.0 cm. long, essentially glabrous, the secondary 0.4–1.0 cm. long, minutely and sparsely pilosulose; pedicels 2.0–2.2 cm. long, essentially glabrous; bracts lanceolate, 0.05–0.1 cm. long; calyx-lobes ovate-lanceolate, acuminate, 0.25–0.3 cm. long, minutely papillate without, the squamellae deltiform, minutely erose; corolla rotate, glabrous or very indefinitely papillate without, the tube 0.2–0.35 cm. long, about 0.15 cm. in diameter at the base and 0.35–0.4 cm. in diameter at the orifice, barely

constricted just below the insertion of the stamens, the lobes obliquely obovate-dolabriform, subcaudate-acuminate, 1.1–1.3 cm. long, spreading; stamens widely exserted, the anthers 0.6–0.7 cm. long, the filaments 0.5–0.6 cm. long, minutely puberulent-papillate above; ovary ovoid, about 0.1 cm. long, glabrous; nectaries essentially separate, somewhat shorter than the ovary; stigma 0.15 cm. long; follicles unknown.

MEXICO: MORELOS: barranca near Cuernavaca, Aug. 2, 1896, *Pringle 7242* (US); bluffs of barranca near Cuernavaca, alt. 5000 ft., Aug. 10, 1898, *Pringle 6966* (MBG, NY, US).

**3. *Thenardia gonoloboides* Woodson, spec. nov.**

Suffrutices volubiles; ramulis teretibus tenuibus glabris; foliis oppositis breviter petiolatis lanceolatis apice anguste acuminatis basi obtusis tenuiter membranaceis glabris vel nervo medio subtus basi minutissime puberulis 4–8 cm. longis 1.3–2.5 cm. latis petiolo 0.5–1.0 cm. longo glabro; inflorescentiis foliis multo brevioribus multifloris; pedunculis primariis 0.5–1.2 cm. longis minute puberulo-papillatis secundariis vix manifestis; pedicellis 0.7–0.8 cm. longis minute puberulo-papillatis; bracteis anguste lanceolatis 0.1–0.3 cm. longis; calycis laciniis lineari-lanceolatis anguste acuminatis 0.5–0.7 cm. longis squamellis anguste oblongo-trigonalibus integris; corollae rotatae extus glabrae vel indistinctissime papillatae tubo 0.3–0.35 cm. longo basi ca. 0.125 cm. diametro metiente ostio ca. 0.25 cm. diametro metiente paulo supra medium abrupte constricto ubique staminigero lobis oblique obovatis obtusis 0.6–0.65 cm. longis patulis; staminum antheris valde exsertis 0.3–0.35 cm. longis filamentis 0.4 cm. longis indistinctissime papillatis; ovario ovoideo ca. 0.1 cm. longo glabro; nectariis haud crescentibus ovario ca. dimidio brevioribus; stigmate 0.1 cm. longo; folliculis ignotis.

Stems relatively slender, glabrous; leaves opposite, shortly petiolate, lanceolate, apex narrowly acuminate, base obtuse, 4–8 cm. long, 1.3–2.5 cm. broad, delicately membranaceous, glabrous, or very minutely puberulent at the base of the midrib beneath; petioles 0.5–1.0 cm. long, glabrous; inflorescence much shorter than the subtending leaves, multiflorous; primary

peduncle 0.5–1.2 cm. long, minutely puberulent-papillate, the secondary scarcely manifest; pedicels 0.7–0.8 cm. long, minutely puberulent-papillate; bracts narrowly lanceolate, 0.1–0.3 cm. long; calyx-lobes linear-lanceolate, narrowly acuminate, 0.5–0.7 cm. long, the squamellae narrowly oblong-trigonal, entire; corolla rotate, glabrous or very indistinctly papillate without, the tube 0.3–0.35 cm. long, base about 0.125 cm. in diameter, orifice about 0.25 cm. in diameter, abruptly constricted slightly above midway at the insertion of the stamens, the lobes obliquely obovate, obtuse, 0.6–0.65 cm. long, spreading; stamens conspicuously exserted, the anthers 0.3–0.35 cm. long, the filaments 0.4 cm. long, indistinctly papillate; ovary ovoid, 0.1 cm. long, glabrous; nectaries essentially separate, about half equalling the ovary; stigma 0.1 cm. long; follicles unknown.

MEXICO: OAXACA: canyons of mountains near Oaxaca, alt. 6500 ft., Aug. 20, 1894, *Pringle 4822* (MBG, TYPE, NY, US).

Closely related to the following species, from which it may be distinguished, in addition to the key characters, by the somewhat larger corolla in general, with tube constricted slightly above the middle, and by the larger anthers with filaments very indistinctly papillate.

**4. *Thenardia Galeottiana* Baill. Bull. Soc. Linn. Paris 2: 819. 1890.**

Stems relatively slender, glabrous; leaves opposite, petiolate, elliptic-lanceolate, apex acuminate, base obtuse, 3–9 cm. long, 0.6–2.5 cm. broad, membranaceous, glabrous above, beneath minutely puberulent in the lower axils of the midrib to glabrate; petioles 0.4–0.9 cm. long, glabrous; inflorescence much shorter than the subtending leaves, multiflorous; primary peduncle 0.4–0.6 cm. long, minutely puberulent-papillate, the secondary scarcely manifest; bracts lanceolate, 0.05–0.2 cm. long; calyx-lobes 0.4–0.6 cm. long, narrowly acuminate, minutely puberulent-papillate below, the squamellae oblong-dentiform, minutely erose; corolla rotate, glabrous or very indistinctly papillate without, the tube 0.2–0.25 cm. long, base

about 0.1 cm. in diameter, orifice about 0.2 cm. in diameter, abruptly constricted slightly below midway and there stamiferous, the lobes obliquely ovate, acute, 0.5–0.55 cm. long, spreading; stamens widely exerted, the anthers 0.25 cm. long, the filaments 0.2–0.25 cm. long, puberulent-papillate; ovary ovoid, about 0.07 cm. long, glabrous; nectaries equalling or slightly surpassing the ovary, essentially separate; stigma 0.1 cm. long; follicles unknown.

MEXICO: OAXACA: Talea, alt. 3000 ft., Aug., 1844, *Galeotti 1565* (MBG, NY, US, ISOTYPES); GUERRERO: Iguala Canyon, alt. 2500 ft., Sept. 21, 1905, *Pringle 13585* (G, US).

Galeotti reported the flowers of his specimens as "albidis," which would appear to apply to the preceding species as well. However, unlike those of *Th. gonoloboides*, the tips of the corolla-lobes of *Th. Galeottiana* appear to be lined with pink upon the basis of herbarium specimens.

#### EXCLUDED SPECIES

*Thenardia* (?) *corymbosa* Benth. in Hook. Jour. Bot. 3: 246. 1841 = *Forsteronia umbellata* (Aubl.) Woodson, Ann. Mo. Bot. Gard. 22: 208. 1935 (*Apocynum umbellatum* Aubl. Hist. Pl. Gui. Fr. 1: 275; 3: pl. 108. 1775).

*Thenardia* (?) *laurifolia* Benth. Hook. Jour. Bot. 3: 246. 1841 = *Forsteronia laurifolia* (Benth.) A. DC. in DC. Prodr. 8: 438. 1844.

*Thenardia umbellata* (Aubl.) Spreng. Syst. 1: 636. 1825 (*Apocynum umbellatum* Aubl. Hist. Pl. Gui. Fr. 1: 275; 3: pl. 108. 1775) = *Forsteronia umbellata* (Aubl.) Woodson, Ann. Mo. Bot. Gard. 22: 208. 1935.

#### XXVI. PRESTONIA R. Br.

*Prestonia* R. Br. Mem. Wern. Soc. 1: 69. 1811; A. DC. in DC. Prodr. 8: 428. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 161. 1860; Benth. & Hook. Gen. Pl. 2: 709. 1876; Miers, Apoc. So. Am. 143. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895.

*Haemadictyon* Lindl. Trans. Hort. Soc. 6: 70. 1826; A. DC. loc. cit. 425. 1844; Muell.-Arg. loc. cit. 165. 1860; Miers, loc. cit. 254. 1878.

*Rhaptocarpus* Miers, loc. cit. 151. 1878.

*Temnadenia* Miers, loc. cit. 207. 1878, in part.

*Mitozus* Miers, loc. cit. 217. 1878, in part.

*Exothosiemon* G. Don, according to Miers, loc. cit. 238. 1878, in part.

*Belandra* S. F. Blake, Contr. Gray Herb. 52: 78. 1917.

*Echites* of authors, in part, not P. Br.

Lactescent, suffruticose or suffrutescent lianas. Stems voluble, terete, the branches opposite, or opposite below becoming alternate above. Leaves opposite, entire, penninerved, eglandular; nodes stipulate. Inflorescence lateral, rarely subterminal, bostrychoidally racemose, frequently corymbose, bracteate. Calyx 5-parted, the lobes essentially equal, cleft nearly to the receptacle, imbricated, bearing within a solitary, opposite squamella. Corolla salverform, rarely infundibuliform, the tube straight or very rarely slightly gibbous, usually bearing 5 epistaminal appendages within, or exappendiculate, or the appendages replaced by vertical, callous ridges, the orifice bearing a callous, faecal annulus, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel sporangia borne ventrally near the apex of an enlarged, narrowly sagittate, peltate connective; pollen granular; filament short, subcylindrical, variously pubescent. Carpels 2, united at the apex by a common stylar shaft surmounted by the fusiform or subcapitate, occasionally maniculate or digitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or completely conerescent. Follicles 2, apocarpous or more or less agglutinated, dehiscing along the ventral suture, containing many dry, truncate or inconspicuously rostrate, apically comose seeds.

Type species: *Prestonia tomentosa* R. Br. Mem. Wern. Soc. 1: 70. 1811.



## KEY TO THE SECTIONS

- A. Corolla exappendiculate within, the faucal annulus relatively tenuous and inconspicuous, not greatly thickened or tuberculate; anthers wholly included.....Sect. 1. COALITAE
- AA. Corolla appendiculate within (except in certain species of § *Tomentosae*), the faucal annulus conspicuously thickened or tuberculate; anther-tips exerted, often barely so (included in certain species of § *Tomentosae*).
  - B. Calyx-lobes relatively small and inconspicuous, only slightly foliaceous, usually more or less reflexed.....Sect. 2. ACUTIFOLIAE
  - BB. Calyx-lobes relatively large and conspicuous, strikingly foliaceous or coriaceous, not reflexed.
  - C. Corolla glabrous or merely papillate without.....Sect. 3. ANNULARES
  - CC. Corolla densely pubescent without, at least the lobes..Sect. 4. TOMENTOSAE

Sect. 1. COALITAE Woodson. Relatively slender, glabrous (pubescent in *P. solanifolia*) lianas; leaves membranaceous; inflorescence simple, typically bostrychoid-racemose; calyx-lobes relatively inconspicuous, slightly foliaceous; corolla glabrous without, exappendiculate within, the faucal annulus relatively tenuous and inconspicuous, not greatly thickened and tuberculate; anthers wholly included. *Spp.* 1-4.

## KEY TO THE SPECIES

- a. Inflorescence relatively elongate, longer than the subtending leaves; corolla-lobes narrowly oblong-lanceolate; plants of the Antilles....1. *P. agglutinata*
- aa. Inflorescence corymbose, shorter than the subtending leaves; corolla-lobes obovate; species of South America.
  - b. Plants glabrous, or only the lower surface of the leaves inconspicuously puberulent-papillate.
    - c. Calyx-lobes lanceolate to oblong-lanceolate, acuminate; corolla-tube not inflated at the base.....2. *P. coalita*
    - cc. Calyx-lobes broadly obovate, rounded or obtuse; corolla-tube conspicuously inflated at the base.....3. *P. Dusenii*
    - bb. Plants softly and densely ferruginous-puberulent, particularly the foliage.....4. *P. solanifolia*

1. *Prestonia agglutinata* (Jacq.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.

*Echites agglutinata* Jacq. Enum. Pl. Carib. 13. 1760.

*Echites adglutinata* Jacq. Stirp. Amer. 31. pl. 23. 1763;

A. DC. in DC. Prodr. 8: 448. 1844, not Burm., sphalm.

*Echites circinalis* Sw. Prodr. 52. 1788; A. DC. loc. cit. 466. 1844.



*Echites sanguinolenta* Tussac, Fl. Ant. 95. pl. 11. 1808.

*Haemadictyon circinalis* (Sw.) G. Don, Gen. Hist. 4: 83. 1838.

*Echites leptoloba* Stadelm. Flora 24<sup>1</sup>: Beibl. 15. 1841.

*Haemadictyon nutans* (Anders.) A. DC.  $\beta$  *sanguinolenta* (Tussac) A. DC. loc. cit. 426. 1844.

*Echites revoluta* A. DC. loc. cit. 457. 1844.

*Echites circinalis* Sw.  $\beta$  *Thomasiana* A. DC. loc. cit. 466. 1844.

*Temnadenia leptoloba* (Stadelm.) Miers, Apoc. So. Am. 211. 1878.

*Anechites adglutinata* (Jacq.) Miers, loc. cit. 236. 1878.

*Anechites circinalis* (Sw.) Miers, loc. cit. 1878.

*Anechites Thomasiana* (A. DC.) Miers, loc. cit. 237. 1878.

Plants completely glabrous; stems terete, relatively slender; leaves elliptic-oblong to broadly oval, apex shortly acuminate, base obtuse or rounded, 4–12 cm. long, 2–8 cm. broad, firmly membranaceous, opaque; petioles 1.2–2.5 cm. long; stipular appendages numerous, interpetiolar, minutely dentiform-flagelliform; racemes relatively elongate and lax, bearing 10–20 pale, greenish-white flowers; peduncle more or less flexuous, usually somewhat longer than the subtending leaves; pedicels 0.1–0.2 cm. long, somewhat accrescent after maturity; bracts ovate-lanceolate, scarious or somewhat subfoliaceous, about equalling the pedicels; calyx-lobes ovate-lanceolate, acuminate, essentially equal, 0.2–0.3 cm. long, scarious or slightly subfoliaceous, the internal squamellae deeply lacinate; corolla salverform, glabrous without, the tube 0.7–0.8 cm. long, about 0.1 cm. in diameter at the base, exappendiculate within, the faucal annulus tenuous, relatively inconspicuous, the lobes obliquely oblong-lanceolate, acuminate, about 0.5 cm. long, reflexed; stamens inserted about midway within the corolla-tube, the anthers wholly included, narrowly lanceolate-sagittate, 0.5 cm. long, glabrous; ovary oblongoid, about 0.2 cm. long, abruptly produced into the style, glabrous; stigma 0.15 cm. long; nectaries narrowly compressed-oblongoid, separate, about half as long as the ovary; follicles unknown.

HISPANIOLA: HAITI: eastern La Hotte, Chapelle Mont Carmel, on the descent to Rio Bras Gauche, Nov. 8, 1924, *Ekman 2431* (S); Isle La Tortue, Basse-Terre, in coastal thickets, Oct. 28, 1925, *Ekman 5131* (S); Dept. du Nord, Bayeux, on the road to Aux Borgnes, Nov. 25, 1924, *Ekman 2664* (S); data incomplete, *Swartz s.n.* (S, MBG, photograph).

PORTO RICO: prope Cayey ad Pedro Avila, inter arbores *Coffeae Arabicae*, Sept. 22, 1895, *Sintenis 2457* (S).

It is possible that the specimen from Porto Rico may represent a chance introduction.

**2. *Prestonia coalita* (Vell.) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.**

? *Echites sulphurea* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 26. 1827; A. DC. in DC. Prodr. 8: 468. 1844.

*Echites coalita* Vell. Fl. Flum. 112. 1830; Icon. 3: pl. 40. 1827; A. DC. loc. cit. 458. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 155. 1860.

*Echites Vauthieri* A. DC. loc. cit. 457. 1844; Miers, Apoc. So. Am. 201. 1878.

*Echites Blanchetii* A. DC. loc. cit. 448. 1844; Muell.-Arg. loc. cit. 157. 1860.

*Echites Martii* Muell.-Arg. loc. cit. 155. 1860.

*Rhaptocarpus coalitus* (Vell.) Miers, loc. cit. 152. 1878.

*Rhaptocarpus apiculatus* Miers, loc. cit. 153. 1878.

*Rhaptocarpus Martii* (Muell.-Arg.) Miers, loc. cit. 1878.

*Mitozus Blanchetii* (A. DC.) Miers, loc. cit. 219. 1878.

*Mitozus concinnus* Miers, loc. cit. 223. 1878.

Stems terete, relatively slender, minutely and sparsely puberulent-papillate when young, soon becoming glabrate and conspicuously lenticellate; leaves oblong-lanceolate to rather broadly elliptic, apex acuminate, base obtuse to rounded, 5-15 cm. long, 2-6 cm. broad, firmly membranaceous, above glabrous, beneath puberulent-papillate to glabrate; petioles 0.5-1.0 cm. long; stipular appendages intrapetiolar, 2-4, minutely denticiform-flagelliform; racemes simple, more or less corymbose, bearing 8-20 pale greenish-yellow flowers; peduncle  $\frac{1}{2}$ - $\frac{1}{3}$  as long as the subtending leaves; pedicels 0.5-0.7 cm. long, somewhat accrescent after maturity, minutely puberulent-papillate

to glabrate; bracts ovate-lanceolate, 0.2–0.3 cm. long, subfoliaceous; calyx-lobes lanceolate to oblong-lanceolate, acuminate, 0.3–0.5 cm. long, foliaceous or subfoliaceous, minutely papillate to glabrate without, the internal squamellae deltoid, entire or somewhat erose; corolla salverform, glabrous or indistinctly papillate without, the tube 1.0–1.7 cm. long, about 0.15 cm. in diameter at the base, exappendiculate within, the faucal annulus tenuous, relatively inconspicuous, the lobes obliquely obovate, obtuse to shortly acuminate, 0.5–0.8 cm. long, reflexed; stamens inserted about midway within the corolla-tube, the anthers wholly included, narrowly lanceolate-sagittate, 0.5–0.6 cm. long, glabrous; ovary ovoid, abruptly produced into the style, about 0.1 cm. long, glabrous; stigma 0.15 cm. long; nectaries ovoid, separate, somewhat shorter than the ovary; follicles relatively slender, conspicuously moniliform, usually united at the tips, 20–45 cm. long, glabrous; seeds about 1 cm. long, the pale yellowish coma about 2.5 cm. long.

BRAZIL: CEARA: Crato, in "caapuerão," March 20, 1910, *Löfgren 620* (S); data incomplete, *Gardner 1755* (V); BAHIA, Jacobina, date lacking, *Blanchet 3515* (V); MINAS GERAES: Ilheus, 1859–60, *Wawra & Maly 279* (V); Praesidide de St. J. Bapt., date lacking, *Sellow 35* (V); Caldas Caxoeira, Jan. 26, 1826, *Widgren s.n.* (S); Caldas, 1857, *Regnell II 358* (S); Lagoa Santa, date lacking, *Warming s.n.* (C, S); RIO DE JANEIRO: Mandioca, date lacking, *Mikan s.n.* (V); Cantagallo, date lacking, *Pohl 5397* (V); Burity Pequeno, date lacking, *Pohl 2452* (V); data incomplete: *Widgren s.n.* (S); *Pohl 5168* (V); SÃO PAULO: prope Penha in districtu urbis S. Paulo, alt. 750 m., 1902, *Wacket s.n.* (V); Mooca, buschwald, Febr. 23, 1913, *Brade 5696* (S); Serra de Caracol, Dec. 25, 1875, *Mosen 4269* (S); PARANA: in silvula ad flumen Rio Tibagy pr. Ponta Grossa, Jan. 7, 1904, *Dusen s.n.* (S); same locality, March 17, 1909, *Dusen 8038* (S); Jaguarihyva, ad marginem silvae primaevae, alt. 740 m., May 8, 1914, *Jönsson 286a* (S, MBG); Capão Grande, in silvula, Dec. 23, 1903, *Dusen 2939* (S); RIO GRANDE DO SUL: Santo Angelo pr. Cachoeira, Jan. 16, 1893, *Malme 502* (S); Porto Alegre, Morro da Polieria, Cascatas, Dec. 16, 1901, *Malme 827* (S); Santo Angelo, Jan. 14, 1893, *Lindmann 957* (S); MATTO GROSSO: Santa Anna da Chapava, March 12, 1894, *Malme 1472* (S); Santa Cruz da Barra, in ripa dumetosa fluvii Paraguay, March 25, 1894, *Lindmann 3163* (S); DATA INCOMPLETE: *Widgren 1325* (S); *Riedel s.n.* (S).

**3. *Prestonia Dusenii* (Malme) Woodson, Ann. Mo. Bot. Gard. 18: 552. 1931.**

*Echites Dusenii* Malme, Arkiv f. Bot. **22A**<sup>2</sup>: 9. 1928.

Stems terete, relatively slender, minutely papillate when

young, glabrate and conspicuously lenticellate when fully mature; leaves broadly elliptic-oblong, apex subcaudate-acuminate, base obtuse or rounded, 5-15 cm. long, 2.5-6.0 cm. broad, above minutely and sparsely papillate to glabrate, minutely puberulent along the midrib, beneath minutely puberulent-papillate, firmly membranaceous; petioles 1.0-1.3 cm. long; stipular appendages interpetiolar, numerous, minutely denticiform; racemes corymbose, simple, bearing 5-12 greenish-yellow flowers; peduncle about as long as the subtending petioles; pedicels 0.7-0.8 cm. long, somewhat accrescent after maturity, minutely puberulent-papillate; bracts ovate, 0.1-0.3 cm. long, foliaceous; calyx-lobes obovate, minutely mucronulate, somewhat unequal, 0.5-0.7 cm. long, foliaceous, minutely papillate without at the base, the internal squamellae deltoid-trigonal, minutely lacerate; corolla salverform, minutely papillate without, the tube 1.0-1.3 cm. long, about 0.25 cm. in diameter at the base, conspicuously narrowing toward the orifice, exappendiculate within, the faucal annulus tenuous, relatively inconspicuous, the lobes obovate, shortly acuminate, 0.7-0.8 cm. long, reflexed; stamens inserted somewhat below midway within the corolla-tube, the anthers wholly included, narrowly sagittate, about 0.5 cm. long, glabrous; ovary ovoid, 0.1 cm. long, glabrous; stigma 0.1 cm. long; nectaries compressed-ovoid, somewhat concrescent at the base, about half as long as the ovary; follicles relatively stout and rigid, united at the apex, 18-23 cm. long, glabrous; seeds not seen.

BRAZIL: PARANÁ: Alexandra, Serra da Prata, ad marg. silvae prim., March 5, 1911, *Dusen* 11486 (S, TYPE, MBG, photograph and analytical drawings); SÃO PAULO: Santos, Jan. 20, 1875, *Mosen* 3433 (S).

From slight intergradations observed, it is suspected that *P. Dusenii* and *P. coalita* may hybridize in the field.

4. *Prestonia solanifolia* (Muell.-Arg.) Woodson, comb. nov.  
*Haemadictyon* (?) *solanifolium* Muell.-Arg. in Mart. Fl.  
Bras. 6<sup>1</sup>: 171. pl. 49. 1860.  
*Temnadenia solanifolia* (Muell.-Arg.) Miers, Apoc. So.  
Am. 214. 1878.

*Temnadenia corrugulata* Miers, loc. cit. 215. 1878.

*Temnadenia tenuicula* Miers, loc. cit. 216. 1878.

Stems terete, relatively stout, densely ferruginous-hirtellous, conspicuously lenticellate when fully mature; leaves elliptic to oval, apex acuminate, base obtuse or rounded, 7–13 cm. long, 3.5–7.0 cm. broad, firmly membranaceous, above minutely and relatively sparsely hirtellous-strigillose to glabrate, beneath densely ferruginous-hirtellous; petioles 0.9–1.3 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform; racemes densely corymbose, bearing 15–40 bright yellow flowers; peduncle somewhat longer than the subtending petioles, minutely ferruginous-hirtellous; pedicels 0.7–1.0 cm. long, somewhat accrescent after maturity, minutely ferruginous-hirtellous; bracts lanceolate, 0.2–0.3 cm. long, subfoliaceous; calyx-lobes oblong-lanceolate, acuminate, 0.3–0.35 cm. long, subfoliaceous, rather sparsely and laxly ferruginous-pilosulose without, the internal squamellae deeply lacerate; corolla salverform, minutely papillate to glabrate without, the tube 0.8–1.0 cm. long, about 0.2 cm. in diameter at the base, ex-appendiculate within, the faucal annulus tenuous and relatively inconspicuous, the lobes obliquely obovate, shortly acuminate, 0.6–0.7 cm. long, widely spreading; stamens inserted somewhat below midway within the corolla-tube, the anthers wholly included, oblong-sagittate, 0.3–0.35 cm. long, glabrous; ovary broadly ovoid, about 0.1 cm. long, glabrous or very minutely papillate; stigma fusiform-subcapitate, 0.05 cm. long; nectaries compressed-ovoid, separate, nearly equalling the ovary; immature follicles relatively slender, continuous, united at the apex, densely ferruginous-hirtellous; seeds unknown.

BRAZIL: RIO DE JANEIRO (!): data incomplete, *Schüch s.n.* (V, TYPE, MBG, photograph and analytical drawings); MINAS GERAES: original forest, Matto Virgem, alt. 730 m., Nov. 21, 1930, *Mezia 5337* (MBG); data incomplete, 1831, *Ackermann s.n.* (M, COTYPE, MBG, photograph and analytical drawings); SÃO PAULO: Campinas, Nov., 1894, *Novae 11202* (B).

The collection from São Paulo appears to differ from the more northerly specimen in having somewhat smaller flowers, but is too fragmentary to warrant segregation.



Sect. 2. ACUTIFOLIAE Woodson. Relatively slender, glabrous lianas; leaves membranaceous (coriaceous in *P. marginata*, *pachyphylla*, and *simulans*), usually veined with red or purple when young; inflorescence simple, typically bostrychoid-racemose; calyx-lobes relatively small and inconspicuous, only slightly foliaceous, usually more or less reflexed; corolla glabrous without, appendiculate within, the fauceal annulus conspicuously thickened; anther-tips exserted (except in *P. cyaniphylla* and *P. Hassleri*). *Spp.* 5-13.

## KEY TO THE SPECIES

- a. Anthers rather deeply included; calyx-lobes broadly oblong, not sharply reflexed.
  - b. Leaves oblong-elliptic; corolla-tube not inflated at the base; plants of northern Bolivia.....5. *P. cyaniphylla*
  - bb. Leaves rhomboid-ovate to suborbicular; corolla-tube inflated at the base; species of Paraguay.....6. *P. Hassleri*
- aa. Anther-tips barely exserted, or at least attaining the orifice of the corolla-tube; calyx-lobes lanceolate, the tips reflexed.
  - b. Epistaminal appendages wholly included.
    - c. Leaves membranaceous; anthers pubescent dorsally, or very rarely glabrate.
      - d. Nectaries shorter than the ovary; follicles relatively stout, continuous; plants of Martinique, Guadeloupe, and Trinidad (including Tobago).....7. *P. quinquangularis*
      - dd. Nectaries as long as the ovary or somewhat longer; follicles relatively slender, slightly articulated; plants of Panama and South America.....8. *P. acutifolia*
    - cc. Leaves coriaceous; anthers glabrous.
      - d. Leaves acuminate, not heavily coriaceous, the venation verrucose above in desiccation.....9. *P. marginata*
      - dd. Leaves obtuse or rounded, frequently abruptly mucronulate, heavily coriaceous, the venation not verrucose above.....10. *P. pachyphylla*
  - bb. Epistaminal appendages slightly exserted, or at least attaining the orifice of the corolla-tube.
    - c. Leaves coriaceous or subcoriaceous.....11. *P. simulans*
    - cc. Leaves rather delicately membranaceous.
      - d. Leaves broadly rhombic-ovate to suborbicular; epistaminal appendages slightly exserted.....12. *P. Lindmanii*
      - dd. Leaves rather narrowly oblong-elliptic; epistaminal appendages attaining the orifice of the corolla-tube.....13. *P. lagoensis*

5. *Prestonia cyaniphylla* (Rusby) Woodson, comb. nov.  
*Echites cyaniphylla* Rusby, Bull. N. Y. Bot. Gard. 4: 409.  
 1907.



Stems relatively slender, minutely papillate when very young, soon becoming glabrate and conspicuously lenticellate when fully mature; leaves oblong-elliptic, apex acuminate, base obtuse to rounded, 6–8 cm. long, 2.5–4.0 cm. broad, membranaceous, above glabrous, or sparsely papillate at the base, opaque, beneath glabrous, subglaucous; petioles 1–2 cm. long; stipular appendages intrapetiolar, numerous, narrowly and minutely dentiform; racemes subcorymbose, simple, bearing 12–20 greenish-yellow flowers toward the end of the peduncle; peduncle usually somewhat longer than the subtending leaves, glabrous; pedicels 0.8–1.0 cm. long, somewhat accrescent after maturity, minutely papillate to glabrate; bracts narrowly oblong-lanceolate, 0.1–0.25 cm. long, subfoliaceous; calyx-lobes broadly oblong, acute to abruptly acuminate, 0.45–0.55 cm. long, foliaceous, ascending or slightly spreading, not sharply reflexed, glabrous without, the internal squamellae deltoid, slightly lacerate; corolla salverform, minutely papillate without, the proper-tube 1.2–1.5 cm. long, about 0.3 cm. in diameter at the base, slightly narrowing toward the middle, then again gradually expanding toward the orifice, epistaminal appendages very minute, wholly included, the faucal annulus conspicuously thickened, the lobes obliquely obovate, inconspicuously acuminate, 0.6–0.8 cm. long, reflexed or widely spreading; stamens inserted somewhat below midway within the corolla-tube, the anthers narrowly sagittate, about 0.5 cm. long, glabrous, rather deeply included; ovary ovoid-oblongoid, about 0.2 cm. long, glabrous; stigma 0.125 cm. long; nectaries compressed-ovoid, separate or somewhat conerescent at the base, somewhat shorter than the ovary; follicles relatively long and slender, continuous, agglutinated and united at the tip, 30–45 cm. long, glabrous; seeds about 0.4 cm. long, the pale tawny coma about 2 cm. long.

BOLIVIA: LA PAZ: Milluhuaya in Nord-Yungas, alt. 1200 m., Dec., 1917, *Buchtien* 4572 (G, B); exact locality and date lacking, *Bang* 2267 (MBG, NY, TYPE).

**6. *Prestonia Hassleri* Woodson, spec. nov.**

Suffruticosa volubilis omnino glabra; ramulis teretibus gracilibus maturitate conspicue lenticellatis; foliis rhomboi-

deo-ovatis vel suborbicularibus 4-10 cm. longis 3-7 cm. latis membranaceis supra olivaceis opacis subtus subglaucescentibus; petiolis 0.8-2.0 cm. longis; appendiculis stipulaceis intrapetiolariis multis minute dentiformibus; inflorescentiis racemosis simplicibus plurifloris; pedunculis folia aequantibus vel paulo superantibus; pedicellis 0.7-1.0 cm. longis post maturitatem paulo accrescentibus; bracteis anguste ovatis 0.2-0.3 cm. longis subfoliaceis; calycis laciniis late oblongis acutis vel abrupte acuminatis 0.4-0.5 cm. longis foliaceis ascendentibus patulisve haud reflexis intus basi squamellam deltiformem subintegram gerentibus; corollae salverformis virido-flavae tubo proprio 1.0-1.5 cm. longo basi ca. 0.35 cm. diametro metiente prope apicem sensim angustato appendiculis epistaminalibus minutis profunde inclusis annulo faucale manifeste incrassato lobis oblique obovatis breviter acuminatis 0.5-0.8 cm. longis patentibus; antheris anguste sagittatis 0.5-0.6 cm. longis glabris apice paulo exsertis; ovario ovoideo ca. 0.15 cm. longo glabro; stigmatibus 0.15 cm. longo; nectariis compressis ovoideis integris ovario paulo brevioribus; folliculis juventute gracillimis paulo articulatis glabris agglutinatis; seminibus ignotis.

Plants completely glabrous; stems terete, relatively slender, conspicuously lenticellate when fully mature; leaves rhomboid-ovate or suborbicular, apex abruptly and shortly acuminate, base obtuse or rounded, 4-10 cm. long, 3-7 cm. broad, membranaceous, above olivaceous, opaque, beneath subglaucescent; petioles 0.8-2.0 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence racemose, simple, bearing 20-40 greenish-yellow flowers; peduncle about as long as the subtending leaves or somewhat longer; pedicels 0.7-1.0 cm. long, somewhat accrescent after maturity; bracts narrowly ovate, 0.2-0.3 cm. long, subfoliaceous; calyx-lobes broadly oblong, acute or abruptly acuminate, 0.4-0.5 cm. long, foliaceous, ascending or somewhat spreading, not reflexed, the internal squamellae deltoid, subentire; corolla salverform, glabrous without, the proper-tube 1.0-1.5 cm. long, about 0.35 cm. in diameter at the base, conspicuously narrowed toward the ori-

fice, epistaminal appendages minute, deeply included, the faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.5–0.8 cm. long, reflexed or widely spreading; stamens inserted somewhat below midway within the corolla-tube, the anthers narrowly sagittate, 0.5–0.6 cm. long, the tips slightly exserted or at least attaining the orifice of the corolla-tube, glabrous; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries compressed-ovoid, separate, somewhat shorter than the ovary; immature follicles relatively long and slender, slightly articulated, agglutinated and united at the apex, glabrous; seeds unknown.

PARAGUAY: in regione lacus Ypacaray, March, 1913, *Hassler 12527* (B, C, MBG, TYPE); common in hedges, Villa-Rica, March 12, 1929, *Jørgensen 4182* (MBG); in regione collium, Cordillera de Villa-Rica, Jan., 1905, *Hassler 8765* (B); in sylva, San Bernardino, Dec., year lacking, *Hassler 3583* (B, BB, V); Cordillera de Altos, Oct., 1902, *Fiebrig 64a* (B, DL, G, M).

This species is very close to the preceding, of which it may eventually be proved a variety.

7. *Prestonia quinquangularis* (Jacq.) Spreng. Syst. 1: 637. 1825.

*Echites quinquangularis* Jacq. Enum. Pl. Carib. 13. 1760; Stirp. Amer. 32. pl. 25. 1763; A. DC. in DC. Prodr. 8: 468. 1844.

*Echites nutans* Anders. Trans. Soc. Arts Lond. 25: 203. 1807; Sims, Bot. Mag. 51: pl. 2473. 1824.

*Haemadictyon venosum* Lindl. Trans. Hort. Soc. 6: 70. 1826; Miers, Apoc. So. Am. 255. 1878.

*Haemadictyon nutans* (Anders.) A. DC. loc. cit. 426. 1844.

*Temnadenia quinquangularis* (Jacq.) Miers, loc. cit. 217. 1878.

Stems relatively slender, glabrous, inconspicuously lenticellate when fully mature; leaves oblong- to ovate-elliptic, acute to shortly acuminate, base obtuse to rounded, 6–14 cm. long, 2–6 cm. broad, membranaceous, conspicuously veined with red or purple when young, above glabrous, beneath minutely papillate to glabrous; petioles 1–2 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform; inflores-

cence racemose, simple, bearing 6-20 greenish-yellow flowers; peduncle about as long as the subtending leaves or somewhat shorter, glabrous; pedicels 0.7-1.5 cm. long, somewhat accrescent after maturity, glabrous; bracts ovate-lanceolate, 0.1-0.15 cm. long, subfoliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.15-0.2 cm. long, subfoliaceous, sharply reflexed, glabrous without, the internal squamellae deltoid-ligulate, minutely erose; corolla salverform, minutely papillate without, 1.2-1.5 cm. long, about 0.3 cm. in diameter at the base, the epistaminal appendages about 0.1 cm. long, wholly included, the faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate to obtuse, 0.7-1.0 cm. long, sharply reflexed; stamens inserted slightly above midway within the corolla-tube, the anthers narrowly sagittate, 0.55-0.6 cm. long, pubescent dorsally; ovary ovoid, about 0.2 cm. long, glabrous; nectaries compressed-ovoid, separate or more or less conerescant at the base, somewhat shorter than the ovary; follicles relatively stout, continuous, agglutinated and united at the apex, 20-35 cm. long, glabrous; seeds about 1 cm. long, the tawny coma 2.0-2.5 cm. long.

MARTINIQUE: Pelée, date lacking, *Kunth s.n.* (B).

GUADELOUPE: prope Capesterre, 1892, *Duss 2841* (B); route de Pigeon à la Ponte Noire, Dec. 28, 1895, *Duss 3713* (B).

TRINIDAD: Caparo, April 27, 1908, *Broadway 2707* (B); St. Clair Experiment Station, wild on fences, May 22, 1907, *Broadway 2582* (B, M); O'Meara Savannah, Arima, April 16, 1908, *Broadway 2799* (B); Montpelier, Tobago, running over shrubs and grasses, Oct. 3, 1909, *Broadway 3122* (B); Tobago ad Wellbeck, Nov. 23, 1912, *Broadway 4350* (B); exact locality and date lacking, *von Rohr 23* (C).

The purple venation of the leaves is said by collectors to be replaced by white not infrequently. This species has also been reported locally from Venezuela and the Guianas.

**8. *Prestonia acutifolia* (Benth.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895.**

*Haemadictyon acutifolium* Benth. ex Muell.-Arg. in Mart.

Fl. Bras. 6<sup>1</sup>: 167. 1860; Miers, Apoc. So. Am. 260. 1878.

*Haemadictyon acutifolium* Benth.  $\beta$  *latifolium* Muell.-Arg. loc. cit. 1860.

*Haemadictyon calignosum* Miers, loc. cit. 1878.

*Echites Bangii* Rusby, Bull. N. Y. Bot. Gard. 4: 409. 1907.

*Echites Hulkiana* Pulle, Rec. Trav. Bot. Néerl. 9: 160. 1912.

*Echites Laurentiae-disca* Rusby, Descr. So. Am. Pl. 85. 1920.

*Prestonia acutifolia* (Benth.) K. Sch. var. *latissima* Mgf. Notizblatt 9: 982. 1926.

Stems relatively slender, minutely puberulent when young, glabrate and conspicuously lenticellate when fully mature; leaves elliptic to oblong- or ovate-elliptic, apex acuminate, base obtuse or rounded, firmly membranaceous, usually veined with red or purple when young, above dark green, opaque, glabrous, beneath somewhat paler, minutely and irregularly papillate to glabrous, 6–16 cm. long, 2–8 cm. broad; petioles 0.6–2.0 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence racemose, simple, bearing 6–40 greenish-yellow flowers; peduncle usually somewhat shorter than the subtending leaves, occasionally somewhat longer, glabrous; pedicels 0.5–1.2 cm. long, somewhat accrescent after maturity, glabrous or very minutely papillate; bracts ovate-lanceolate, 0.1–0.2 cm. long, subfoliaceous; calyx-lobes narrowly ovate-lanceolate, acuminate, 0.15–0.2 cm. long, sharply reflexed, subfoliaceous, minutely papillate to glabrous without, the internal squamellae deltoid-liguliform, minutely lacerate or erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.5–2.0 cm. long, about 0.4 cm. in diameter at the base, epistaminal appendages 0.05–0.2 cm. long, wholly included, the faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–1.0 cm. long, sharply reflexed; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers rather broadly sagittate, 0.4–0.55 cm. long, pubescent dorsally, rarely glabrate; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.1 cm. long; nectaries compressed-oblongoid, separate or more or less concrescent, somewhat surpassing, or about equalling the ovary; follicles relatively long and slender, obscurely and rather distantly articulated, ag-



glutinated and united at the apex, usually rather tortuous, 20-40 cm. long, glabrous, or very indistinctly papillate; seeds 0.1 cm. long, the coma pale tawny, 3-4 cm. long.

PANAMA: CANAL ZONE: shore s. of Barbour Trail, Barro Colorado Island, Febr. 12, 1932, *Woodworth & Vestal 498* (FM).

COLOMBIA: SANTANDER: alluvial flat, alt. 80-90 m., Badillo, Jan. 16, 1918, *Pennell 3912* (NY); Rio Surata Valley, between Bucaramanga and El Jaboncillo, alt. 800-1500 m., Jan. 2, 1927, *Killip & Smith 16305* (NY, US); upper Rio Lehrija Valley, northwest of Bucaramanga, alt. 400-700 m., Dec. 29, 1926, *Killip & Smith 16308* (US, NY, B); MAGDALENA: open grass and thickets, rare, near Bonda, alt. 250 m., Nov. 9, Cienaga, Sept. 10, 1898, *H. H. Smith 1645* (NY); ANTIOQUIA: Pto. Berrio, near Medellin, June 20, 1928, *Toro 1105* (NY).

VENEZUELA: DISTRITO FEDERAL: Caracas, date lacking, collector unknown (S); DATA INCOMPLETE: May, 1896, *Rusby & Squires 302* (B, M, MBG, NY); AMAZONAS: ad fl. Casiquiari, 1853-54, *Spruce 3430* (V).

DUTCH GUIANA: on river banks, fluv. Lucie, Nov. 26, 1910, *Hulk 303* (U).

BRAZIL: AMAZONAS: in vicinibus Barra, Prov. Rio Negro, Dec., 1850-March, 1851, *Spruce 1002* (B, Camb., M, TYPE, V); Bôa Vista, Rio Branco super., in silvis ripariis, July, 1913, *Kuhlmann 3650* (B); MATTO GROSSO: Cuyaba, July 2, 1903, *Malme 3122* (S); in "cerrado" pr. oppidium Cuyaba, March 22, 1904, *Malme 1478* (B, DL, S); ad villam Cuyabensis, date lacking, *Manso & Lhotsky 37* (B); DATA INCOMPLETE: *Martius s.n.* (M); *Glaziov 20412* (B).

PERU: LORETO: Puerto Arturo, lower Rio Huallaga below Yurimaguas, dense forest, alt. about 135 m., Aug. 24-25, 1929, *Killip & Smith 27840* (MBG, US); Amaqueria, Stromgebiet des Ucayali von 10° S. bis zur Mündung, Nov. 24, 1923, *Tessmann 3368* (B, DL); Mündung des Apaga, Stromgebiet des Maranon von Jiquitos aufwärts bis zur Santiago-Mündung am Pongo de Manseriche, ca 77° 30' West., alt. 145 m., Dec. 23, 1924, *Tessmann 4816* (B); Mishuyacu, near Iquitos, alt. 100 m., forest, April, 1930, *Klug 1119* (NY, US); HUANUCO: zwischen Monzon und den Huallaga, alt. 600-700 m., Aug. 28, 1903, *Weberbauer 3605* (B, DL); JUNIN: thickets, La Merced, alt. about 700 m., May 29-June 4, 1929, *Killip & Smith 23387* (MBG, US); in sunny montana along stream, same locality, Aug. 10-24, 1923, *Macbride 5245* (B, FM); SAN MARTIN: Alto Rio Huallaga, alt. 360-900 m., Dec., 1929, *Williams 5550* (FM, MBG).

BOLIVIA: SANTA CRUZ: bosques de Buenavista, alt. 450 m., April 22, 1917, *Steinbach 3331* (B); quintas de la ciudad de Santa Cruz, alt. 450 m., Febr. 20, 1917, *Steinbach 3256* (B); BENI: Rurrenabaque, alt. 1000 ft., Dec. 1, 1921, *Cardenas 1748* (NY); DATA INCOMPLETE: *Bong 2053* (B, MBG, NY).

PARAGUAY: in reg. cursu superioris fl. Apa, Dec., 1901, *Hassler 3172* (B, BB, V); in reg. vicine San Estanislao, Jan., year lacking, *Hassler 6001* (B, BB); Centurion, Jan. 5, 1909, *Fiedrig 4541* (B); in altaplanitie et declivibus "Sicera de Amambay," March, 1908, *Eojas 10270* (B).

ARGENTINA: FORMOSA: Villa, Febr., 1918, *Jørgensen 3119* (B, BA, MBG).

It is not improbable that an accumulation of additional specimens will necessitate the segregation of *P. acutifolia* as



interpreted in this revision. At the present moment the number of specimens appears too scanty, considering the vast geographical distribution of the species, to merit division into subsidiary units.

**9. *Prestonia marginata* (Benth.) Woodson, comb. nov., not Mgf.**

*Haemadictyon marginatum* Benth. in Hook. Jour. Bot. 3: 250. 1841; A. DC. in DC. Prodr. 8: 426. 1844; Miers, Apoc. So. Am. 256. 1878.

*Haemadictyon Cayennense* A. DC. loc. cit. 427. 1844; Miers, loc. cit. 1878.

*Haemadictyon papillosum* Muell.-Arg. Linnaea 30: 432. 1860.

Stems terete, relatively slender, minutely and sparsely hispidulous when young, glabrate, or scabridulous in the vicinity of the nodes, and rather inconspicuously lenticellate when fully mature; leaves oblong-elliptic, apex acuminate to subcaudate-acuminate, base acute to obtuse, 6–12 cm. long, 2–5 cm. broad, glabrous, coriaceous, but not very thickly so, either surface somewhat nitidulous, the venation more or less verrucose throughout; petioles 0.3–0.4 cm. long; stipular appendages interpetiolar, 6–8, minutely dentiform; inflorescence racemose, simple, or rarely dichotomous, bearing 10–40 pinkish-yellow flowers; peduncle about equalling or somewhat surpassing the subtending leaves; pedicels 0.8–1.5 cm. long, somewhat accrescent after maturity, glabrous or very minutely and sparsely papillate; bracts ovate-lanceolate, 0.8–1.0 cm. long, scarious; calyx-lobes ovate-lanceolate, acuminate, 0.2–0.3 cm. long, somewhat reflexed or spreading, glabrous to very irregularly papillate without, the internal squamellae deltoid, somewhat cleft or divided; corolla salverform, glabrous without, 1.3–1.7 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages 0.05–0.07 cm. long, wholly included, the faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.8–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the

anthers oblong-sagittate, 0.5 cm. long, glabrous; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.1 cm. long; nectaries compressed-ovoid, separate or somewhat conerescent at the base, somewhat shorter than the ovary; follicles relatively slender, continuous or very obscurely articulated, usually somewhat falcate and united at the apex, 11–16 cm. long, glabrous; seeds about 1.1 cm. long, shortly rostrate, the pale yellowish coma about 2.5 cm. long.

BRITISH GUIANA: Pirara, date uncertain, *Schomburgk 713* (K, TYPE); banks of the Potaro River, Tumatumari, July 4–6, 1921, *Gleason 336* (NY, US); Malali, Demerara River, lat. about 5° 35' N., Oct. 30–Nov. 5, 1922, *Crus 2631* (G).

FRENCH GUIANA: Cayenne, date lacking, *Vargas s.n.* (DC).

BRAZIL: PARA: overflow bank, Rio Thome Assu, Distrito Acara, alt. 35 m., Aug. 1, 1931, *Mez 6029* (MBG).

**10. *Prestonia pachyphylla* Woodson, nom. nov.**

*Prestonia marginata* Mgf. Notizblatt 9: 88. 1924, not  
*Haemadictyon marginatum* Benth. (*Prestonia marginata* (Benth.) Woodson).

Stems relatively stout, minutely and rather sparsely pilosulose when very young, glabrate, or minutely scabridulous in the vicinity of the nodes, and rather inconspicuously lenticellate when fully mature; leaves broadly oval, apex obtuse to rounded, frequently abruptly mucronulate, base broadly obtuse to rounded, 6–12 cm. long, 2–4 cm. broad, glabrous, heavily coriaceous, either surface somewhat nitidulous, below somewhat glaucescent, the venation not verrucose above; petioles 0.5–0.8 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence racemose, simple, bearing 20–40 greenish-yellow flowers; peduncle glabrous to very inconspicuously papillate, somewhat surpassing the subtending leaves; pedicels 0.7–1.0 cm. long, somewhat accrescent after maturity, glabrous to very inconspicuously papillate; calyxlobes ovate-lanceolate, acuminate, 0.3–0.4 cm. long, somewhat reflexed or spreading, glabrous without, the internal squamellae somewhat incised or divided; corolla salverform, glabrous or very inconspicuously papillate without, 1.2–1.3 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages 0.2–0.25 cm. long, wholly included, the faucal an-

nulus conspicuously thickened, the lobes obliquely obovate, rounded, 0.8–1.0 cm. long, reflexed; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, about 0.5 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.1 cm. long; nectaries compressed-oblongoid, somewhat surpassing the ovary, separate or somewhat concrescent at the base; follicles unknown.

BRAZIL: AMAZONAS: Serra de Mairary, Surumu, Rio Branco, Nov., 1909, *Ule* 8451 (B, TYPE, MBG, photograph and analytical drawings).

**11. *Prestonia simulans* Woodson, spec. nov.**

Suffruticosa vel fruticosa volubilis; ramulis gracilibus glabris maturitate rimulosis inconspicueque lenticellatis; foliis oblongo-ellipticis apice obtusis minute mucronatis basi obtusis 8–10 cm. longis 3–4 cm. latis coriaceis subcoriaceisve glaberrimis supra plus minusve illustribus subtus opacis margine post exsiccationem leviter revolutis; petiolis 0.2–0.3 cm. longis glabris; inflorescentiis lateralibus simplicibus foliis subaequantibus flores gilvos 8–10 laxe gerentibus; pedunculo glaberrimo parte tertia superiore florifero; pedicellis 1.3–1.5 cm. longis glabris; bracteis minute ovato-lanceolatis vix bene visis; calycis laciniis ovato-lanceolatis acuminatis apice plus minusve reflexis 0.4–0.45 cm. longis subfoliaceis glaberrimis intus basi squamellam deltoideo-ligulatam integram vel irregulariter bifidem gerentibus; corollae salverformis tubo 0.9–1.0 cm. longo basi ca. 0.125 cm. diametro metiente supra basi aliquid ampliato deinde ad insertionem staminum gradatim angustato faucibus ca. 0.15 cm. diametro metientibus extus glabris intus prope insertionem staminum minute retrorseque barbatis appendicibus epistaminalibus linearibus ca. 0.2 cm. longis paulo exsertis annulo faucium conspicue incrassato, lobis oblique obovato-dolabriformibus breviter acuminatis 1.0–1.2 cm. longis patentibus; antheris lanceolato-sagittatis 0.5 cm. longis glabris apice exsertis; ovario ovoideo ca. 0.2 cm. longo glabro; stigmatibus 0.1–0.125 cm. longo; nectariis compressis ovoideis haud concrescentibus ca. 0.15 cm. longis; folliculis ignotis.

Stems relatively slender, glabrous, rimulous and inconspicuously lenticellate at maturity; leaves opposite, shortly petiolate, oblong-elliptic, apex obtuse, minutely mucronate, base obtuse, 8–10 cm. long, 3–4 cm. broad, coriaceous or subcoriaceous, above more or less lustrous, beneath opaque, the margin somewhat revolute in desiccation; petioles 0.2–0.3 cm. long, glabrous; inflorescence simple, relatively lax, about equalling the subtending leaves, bearing 8–10 yellowish flowers; peduncle glabrous, the upper third floriferous; pedicels 1.3–1.5 cm. long, glabrous; bracts minutely ovate-lanceolate, very minute; calyxlobes ovate-lanceolate, acuminate, the tips more or less reflexed, 0.4–0.45 cm. long, subfoliaceous, glabrous, the internal squamellae deltoid-ligular, entire or irregularly bifid; corolla salverform, the tube 0.9–1.0 cm. long, about 0.125 cm. in diameter at the base, somewhat inflated below midway, thence gradually constricted toward the insertion of the stamens, about 0.15 cm. in diameter at the orifice, glabrous without, retrorsely barbate above the insertion of the stamens within, epistaminal appendages linear, about 0.2 cm. long, somewhat exserted, faucal annulus conspicuous, the lobes obliquely obovate-dolabriform, shortly acuminate, 1.0–1.2 cm. long, reflexed; anthers lanceolate-sagittate, 0.5 cm. long, glabrous, the tips exserted; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.1–0.125 cm. long; nectaries compressed-ovoid, not conerescent, about 0.15 cm. long; follicles unknown.

COLOMBIA: CUNDINAMARCA: Tocaima, Dec., 1932, *Arbelaes* 2140 (US, TYPE, MBG, analytical drawings).

Closely approaching the habit of *P. pachyphylla*, from which it differs in the exsertion of the epistaminal appendages.

**12. *Prestonia Lindmanii*** (Malme) Hoehne, Comm. Linh. Telegr. Estrat. Matto Grosso, Anexo 5, Bot. 6: 88. 1915.

*Haemadictyon Lindmanii* Malme, Bihang till K. Sv. Vet. Akad. Handl. Afd. III. 24<sup>10</sup>: 31. pl. 3. fig. 10. 1899.

Stems relatively slender, minutely puberulent-papillate when very young, soon becoming glabrate and rather inconspicuously lenticellate; leaves broadly rhombic-ovate to sub-

orbicular, apex shortly and frequently very abruptly acuminate, base obtuse to rounded, 5–10 cm. long, 3–7 cm. broad, membranaceous, glabrous, or very minutely puberulent-papillate when very young, either surface opaque, the lower somewhat paler; petioles 1–3 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform-flagelliform; inflorescence racemose, simple, bearing 10–40 greenish-yellow flowers; peduncle glabrous, usually equalling or somewhat surpassing the subtending petioles; pedicels 1.0–1.25 cm. long, somewhat accrescent after maturity, glabrous; bracts ovate to ovate-lanceolate, 0.15–0.2 cm. long, subfoliaceous; calyx-lobes ovate-lanceolate, acute to acuminate, 0.25–0.35 cm. long, subfoliaceous, glabrous or very inconspicuously papillate without, the internal squamellae deltoid, somewhat incised or lacerate; corolla salverform, glabrous or very minutely papillate without, the tube 1.7–2.0 cm. long, about 0.4 cm. in diameter at the base, epistaminal appendages 0.35–0.45 cm. long, slightly exerted, the faucal annulus conspicuously thickened, the lobes obliquely obovate, inconspicuously acuminate, 0.8–1.0 cm. long, reflexed; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, 0.5 cm. long, glabrous, the tips slightly exerted; ovary ovoid, about 0.25 cm. long, glabrous; stigma 0.15–0.2 cm. long; nectaries compressed-ovoid, separate or somewhat conerescent at the base, about equalling the ovary; follicles relatively long and slender, continuous or essentially so, separate and parallel, or slightly agglutinated when immature, 30–35 cm. long, glabrous; seeds 0.8–1.0 cm. long, shortly rostrate, the pale tawny coma about 2.5 cm. long.

BRAZIL: RIO DE JANEIRO: exact locality and date lacking, *Glaziov 12943, 14072* (B); MATTO GROSSO: Cuyaba, Febr., 1832, *Manso & Lhotsky 33* (B, DL); Corumba, April 7, 1903, *Malmè s.n.* (S); in ripa dumetosa fluvii Paraguay, Santa Cruz da Barra, March 25, 1894, *Lindmann A3161* (S, TYPE, MBG, photograph and analytical drawings); Toscana, Caceres, Jan., 1909, *Hoehne 1200* (B).

PARAGUAY: in reg. cursus superioris fl. Apa, Dec., 1901, *Hassler 8065* (B, BB, V); exact locality and date lacking, *Hassler 3061* (BB).

The collections of Glaziov represented as from Rio de Janeiro are open to suspicion. The inaccuracy of Glaziov's labels is notorious.



**13. *Prestonia lagoensis* (Muell.-Arg.) Woodson, comb. nov.**

*Haemadictyon Lagoense* Muell.-Arg. in Warming, Videnskab. Meddel. Nat. Foren. Kjoeb. 115. 1869.

*Haemadictyon Warmingii* Muell.-Arg. loc. cit. 116. 1869.

Plants completely glabrous; stems relatively slender, inconspicuously lenticellate when fully mature; leaves rather narrowly oblong-elliptic, apex acuminate, base acute, 6.5–10.5 cm. long, 2.3–4.2 cm. broad, membranaceous, either surface opaque, the lower somewhat paler; petioles 0.7–1.7 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence racemose, simple, bearing 10–30 greenish-yellow flowers; peduncle somewhat lax and flexuous, somewhat surpassing the subtending leaves; pedicels 1.5–1.8 cm. long; bracts lanceolate, 0.1–0.15 cm. long, subfoliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.3–0.36 cm. long, subfoliaceous, the internal squamellae deltoid-ligular, inconspicuously incised or divided; corolla salverform, glabrous without, the tube 1.3–1.5 cm. long, about 0.35 cm. in diameter at the base, the epistaminal appendages about 0.2 cm. long, attaining the orifice, the faucal annulus conspicuously thickened, the lobes obliquely obovate, acuminate, 0.7–0.8 cm. long, reflexed; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, 0.5 cm. long, glabrous, the tip barely exerted or at least attaining the orifice of the corolla-tube; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.125 cm. long; nectaries compressed-ovoid, about equalling or slightly surpassing the ovary, separate or somewhat conerescent at the base; follicles unknown.

BRAZIL: MINAS GERAES: Lagoa Santa, 1870, Warming s.n. (C, TYPE, S, MBG, photograph and analytical drawings).

It is quite possible that this is merely a variety of the preceding.

Sect. 3. ANNULARES Woodson. Relatively stout (except in *P. exserta*, *P. velutina*, and *P. parvifolia*), glabrous or softly pubescent lianas; leaves membranaceous to coriaceous; inflorescence simple or variously compound, typically bostrychoid-



racemose to subumbellate; calyx-lobes relatively large and conspicuous, foliaceous, petalaceous, or coriaceous; corolla glabrous or minutely papillate without, appendiculate within, the faucal annulus conspicuously thickened; anther-tips exserted, or at least attaining the faucal annulus. *Spp. 14-45.*

## KEY TO THE SPECIES

- A. Nectaries thick and fleshy (see also 37-38), separate, or only united at the base; species of South America (including Trinidad and Tobago), and Panama.
- B. Suffrutescent lianas; calyx-lobes foliaceous, uniformly green (see also 19, 34, 39).
- C. Anthers glabrous; leaves not cordate.
  - D. Epistaminal appendages surpassing the anthers, inserted at the base of the faucal annulus, or slightly below.
    - E. Bracts relatively inconspicuous, linear to linear-lanceolate, 0.1-0.5 cm. long, only slightly foliaceous.....14. *P. exserta*
    - EE. Bracts very conspicuous, elliptic to obovate-lanceolate, 0.7-1.0 cm. long, manifestly foliaceous.....15. *P. velutina*
  - DD. Epistaminal appendages much surpassed by the anthers, inserted well below the faucal annulus.
    - E. Bracts conspicuously foliaceous, nearly as large as the calyx-lobes; leaves finely puberulent beneath; plants of Ecuador....16. *P. parvifolia*
    - EE. Bracts relatively inconspicuous, only slightly foliaceous, much smaller than the calyx-lobes; leaves glabrous beneath, or essentially so; plants of (southern ?) Brazil.....17. *P. perplexa*
- CC. Anthers minutely pubescent dorsally; leaves usually obscurely and broadly cordate, at least in part, occasionally only somewhat truncate or rounded at the base.....18. *P. mollis*
- BB. Fruticose or suffruticose lianas; calyx-lobes petalaceous or coriaceous, usually more or less suffused or tinted with purple, at least the pedicels so colored.
- C. Epistaminal appendages deeply included.
  - D. Inflorescence simple: anthers glabrous.....19. *P. didyma*
  - DD. Inflorescence compound; anthers minutely pubescent dorsally.
    - E. Calyx-lobes 0.7-1.0 cm. long.
      - F. Corolla-lobes about half as long as the tube; leaves acute to obtuse.....20. *P. annularis*
      - FF. Corolla-lobes about as long as the tube, or nearly so; leaves acuminate.....21. *P. guianensis*
    - EE. Calyx-lobes 1.0-1.8 cm. long.
      - F. Inflorescence dichotomous or rarely trichotomous; calyx greenish or somewhat suffused with purple.
        - G. Calyx-lobes about as long as the corolla-tube, delicately membranaceous.

- H. Calyx-lobes 1.7-1.8 cm. long, somewhat suffused with purple; corolla "raisin purple," the tube 1.7-1.9 cm. long, the lobes 1.0-1.2 cm. long; anthers minutely papillate.....22. *P. purpurissata*
- HH. Calyx-lobes 1.2-1.3 cm. long, greenish; corolla yellowish-pink, the tube 1.2-1.3 cm. long, the lobes 1.4-1.5 cm. long; anthers pilosulose.....*P. discolor*  
(See Addenda)
- GG. Calyx-lobes manifestly shorter than the corolla-tube, coriaceous or subcoriaceous.
- H. Leaves delicately membranaceous; corolla-tube gradually constricting toward the orifice; plants of northeastern Brazil.....23. *P. finitima*
- HH. Leaves subcoriaceous; corolla-tube not constricting toward the orifice; plants of eastern Peru and Bolivia.....24. *P. Phenax*
- FF. Inflorescence branching repeatedly; calyx deep purple.....25. *P. Brittonii*
- CC. Epistaminal appendages exerted, or at least attaining the faucal annulus.
- D. Plants glabrous (very minutely puberulent-papillate generally in 34), or only the inflorescence minutely puberulent to glabrate.
- E. Inflorescence compound, or rarely simple; corolla-tube 1.2-2.3 cm. long.
- F. Inflorescence greatly surpassing the subtending leaves; calyx-lobes delicately membranaceous.....26. *P. laza*
- FF. Inflorescence much shorter than the subtending leaves; calyx-lobes coriaceous or subcoriaceous.
- G. Calyx-lobes 0.9-1.6 cm. long; inflorescence di- or trichotomous.
- H. Bracts very conspicuous, more or less foliaceous or petalaceous, caducous (except in 29).
- I. Epistaminal appendages barely attaining the faucal annulus; flowers yellow; plants of Ecuador.....27. *P. rotundifolia*
- II. Epistaminal appendages exerted.
- J. Inflorescence corymbose, manifestly dichotomous; bracts caducous; flowers greenish-white or yellow; plants of eastern Bolivia.....28. *P. robusta*
- JJ. Inflorescence densely subumbellate-capitate; bracts persistent; flowers reddish, tinted with purple, yellow, and white; plants of northern Brazil.....29. *P. macroneura*
- HH. Bracts very inconspicuous, scarious, persistent.
- I. Corolla-tube essentially glabrous without; anthers glabrous.....30. *P. trifida*
- II. Corolla-tube minutely velutinous without; anthers minutely puberulent dorsally.....31. *P. vana*

- GG. Calyx-lobes 0.5–0.8 cm. long; inflorescence dichotomous or simple.
- H. Leaves obovate to obovate-lanceolate, apex obtuse or rounded; inflorescence dichotomous; squamellae entire or only slightly erose.....32. *P. plumierifolia*
- HH. Leaves broadly oval, shortly acuminate; inflorescence simple or obscurely dichotomous; squamellae deeply lacerate.....33. *P. amazonica*
- EE. Inflorescence simple; corolla-tube 0.7–1.5 cm. long.
- F. Leaves completely glabrous; calyx-lobes 0.9–1.0 cm. long; plants of northern and central Brazil.....34. *P. Lindleyana*
- FF. Leaves puberulent when young, persistently papillate beneath; calyx-lobes 0.4–0.65 cm. long; plants of southeastern Brazil.....35. *P. denticulata*
- DD. Plants more or less densely ferruginous-pubescent throughout.....36. *P. Meg'agros*
- AA. Nectaries thin and more or less diaphanous (except in 37 38), conrescent (frequently irregularly lacerate); species of Central America (including Panama) and Ecuador.
- B. Nectaries more or less thick and fleshy throughout, completely conrescent.
- C. Inflorescence di- or trichotomous, much shorter than the subtending leaves; calyx-lobes 1.0–1.2 cm. long.....37. *P. obovata*
- CC. Inflorescence simple, about as long as the subtending leaves or nearly so; calyx-lobes 0.4–0.5 cm. long.....38. *P. concolor*
- BB. Nectaries thin and more or less diaphanous, at least the margins, conrescent (frequently irregularly lacerate).
- C. Epistaminal appendages deeply included.
- D. Anthers glabrous.
- E. Inflorescence much shorter than the subtending leaves; calyx-lobes 0.8–1.0 cm. long, only slightly suffused with purple at base and tip; corolla-tube gradually constricting toward the orifice; plants of Panama.....39. *P. versicolor*
- EE. Inflorescence about as long as the subtending leaves, or nearly so; calyx-lobes 1.1–1.5 cm. long, conspicuously and generally suffused with purple; corolla-tube not constricting toward the orifice; plants of Ecuador.....40. *P. peregrina*
- DD. Anthers minutely pubescent dorsally.
- E. Inflorescence dichotomous; plants of Colombia.....41. *P. vallis*
- EE. Inflorescence simple; plants of British Honduras.....42. *P. Schippii*
- CC. Epistaminal appendages exerted, or at least attaining the orifice.
- D. Calyx-lobes coriaceous to subcoriaceous; peduncle glabrous or very indefinitely papillate; species of Central America.
- E. Calyx-lobes 0.7–0.9 cm. long, obtusish to acute, scarcely if at all suffused with purple; squamellae acuminate; inflorescence twice to thrice dichotomous.....43. *P. guatemalensis*
- EE. Calyx-lobes 1.1–1.6 cm. long, acuminate, usually deeply suffused with purple; squamellae truncate, usually minutely erose; inflorescence once dichotomous to simple.....44. *P. portobellensis*

DD. Calyx-lobes membranaceous; peduncle densely and minutely ferruginous-puberulent; plants of eastern Peru.....45. *P. lacerata*

**14. *Prestonia exserta* (A. DC.) Standl.** Jour. Wash. Acad. Sci. 15: 460. 1925.

*Haemadictyon exsertum* A. DC. in DC. Prodr. 8: 426. 1844; Miers, Apoc. So. Am. 255. 1878.

*Prestonia tobagensis* Urb. Symb. Ant. 5: 467. 1908.

*Prestonia gracilis* Rusby, Descr. So. Am. Pl. 91. 1920.

Stems relatively slender, softly puberulent when young, becoming glabrate and inconspicuously lenticellate when fully mature; leaves elliptic to broadly oval, acute to shortly acuminate, base obtuse to rounded, 6–12 cm. long, 2–6 cm. broad, membranaceous, either surface opaque, above glabrous, beneath minutely puberulent or glabrate to glabrous; petioles 0.6–1.5 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence corymbose, simple, bearing 10–40 yellow flowers; peduncle somewhat shorter than the subtending leaves, minutely puberulent to glabrate; pedicels 0.8–1.5 cm. long, somewhat accrescent after maturity, minutely puberulent; bracts linear to linear-lanceolate, 0.1–0.5 cm. long, only slightly foliaceous; calyx-lobes linear to linear-lanceolate, rarely oblong-elliptic, 0.6–0.7 cm. long, foliaceous, minutely puberulent without, the internal squamellae minutely lacerate; corolla salverform, glabrous or minutely papillate without, the tube 1.5–1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages inserted at the base of the faucal annulus or slightly below, surpassing the anthers, 0.35–0.55 cm. long, the faucal annulus conspicuously thickened, the lobes broadly dolabriform, shortly acuminate to obtuse, 0.9–1.2 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, 0.45–0.55 cm. long, glabrous; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.12–0.2 cm. long; nectaries somewhat crescent at the base, compressed ovoid-oblongoid, about equaling the ovary; follicles relatively long and slender, somewhat agglutinated when young, eventually somewhat tortuous, 23–29 cm. long, glabrous; seeds 1.2–1.3 cm. long, the pale yellowish coma 2.2–2.7 cm. long.

PANAMA: COCLE: Penonome and vicinity, alt. 50-1000 ft., Febr. 23-March 22, 1908, *Williams 362* (NY); PANAMA: vine on shrubs on more or less forested slopes, Taboga Isl., Febr. 26-7, 1923, *Macbride 2785* (FM).

COLOMBIA: MAGDALENA: rare in forest, near Masinga, Nov. 18, 1898, *H. H. Smith 1644* (NY).

VENEZUELA: MERIDA: La Victoria, alt. 2000 ft., Nov. 21, 1856, *Fendler 2111* (G, MBG); ARAGUA: La Trinidad de Maracay, alt. 440 m., April 18, 1913, *Pittier 6047* (B); DISTRITO FEDERAL: Caracas, 1830, *Vargas 54* (DC, TYPE); in dry bushes, Puerto Escondido, March 2, 1930, *Pittier 13412* (US).

TRINIDAD: Erin, March 13, 1908, *Broadway 2730* (B); Belmont, Valley Road, Nov. 8, 1907, *Broadway 2840* (B); a climber on hedges, Botanic Station, Tobago, Dec. 6, 1909, *Broadway 3373* (B); Spring Road, Scarborough, Nov. 13, 1911, *Broadway 4150* (B, S, U); Welbeck, Tobago, Nov. 23, 1912, *Broadway 4350* (B, M); Knagg's Hill, Port of Spain, Nov. 20, 1921, *Williams 10966* (NY); Tobago prope "Frenchfield" in silvis interior., alt. 400 m., Oct. 23, 1889, *Eggers 5568* (B).

This species is manifestly not as uniform as others of the genus, but segregation has appeared inadvisable upon the basis of our present knowledge. *Williams 362*, from the northernmost known station of the species, is somewhat distinctive in its smaller size in general, and in the somewhat narrower leaves particularly. *Macbride 2785*, collected from not far distant, however, is typical in every obvious respect. The species as recognized above also varies in the pubescence of the leaves, the glabrous extreme being found, with obvious intergradations, upon the small island of Tobago, while the more pubescent are found upon the mainland in Venezuela. Although the type specimen of *P. gracilis* Rusby (*H. H. Smith 1644*) will fall into relationship with *P. exserta* in the key to species, its somewhat broader calyx-lobes suggest that it may represent a natural hybrid with the following species.

**15. *Prestonia velutina* Woodson, Ann. Mo. Bot. Gard. 18: 554. 1931.**

Stems relatively slender, persistently puberulent or pilosulose, apparently not lenticellate; leaves elliptic-lanceolate to broadly oval, apex acuminate, base obtuse, 5-7 cm. long, 2-4 cm. broad, membranaceous, above pilosulose to glabrate, beneath, densely and somewhat yellowish-tomentulose to minutely velutinous; petioles 0.5-1.5 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform-flagelliform; inflorescence corymbose, simple, bearing 10-15 greenish-yellow



flowers; peduncle somewhat shorter than the subtending leaves, shortly hirtellous or pilosulose; pedicels 1.0–1.4 cm. long, somewhat accrescent after maturity, pubescence as on the peduncle; bracts elliptic to obovate-lanceolate, 0.7–1.0 cm. long, conspicuously foliaceous, minutely puberulent; calyx-lobes oblong-lanceolate, acute to acuminate, 1.0–1.2 cm. long, foliaceous, minutely puberulent without, the internal squamellae deltoid-ligular, minutely erose; corolla salverform, glabrous without, the tube 1.6–1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages inserted at the base of the faucal annulus or slightly below, surpassing the anthers, 0.45–0.55 cm. long, the faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.8–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, 0.5 cm. long, glabrous; ovary ovoid, about 0.2 cm. long; stigma 0.15 cm. long; nectaries fleshy, more or less conerescent, somewhat shorter than the ovary; follicles unknown.

COLOMBIA: MAGDALENA: Aracataca, alt. 30 m., Dec. 25, 1925, *Schultze 245* (B); CUNDINAMARCA: moist open loam, alt. 350–400 m., Girardot, July 19, 1917, *Eusby & Pennell 121* (G, NY); Girardot, Febr. 15, 1929, *Toro 59* (NY); TOLIMA: Honda, Aug., 1919, *Ariste-Joseph s.n.* (NY, TYPE, MBG, photograph and analytical drawings).

This species is somewhat intermediate between *P. exserta* and *P. parvifolia*, of which it may conceivably be a hybrid, although it is evidently rather stable in its morphology, and extends without the known range of the former species, except to the north, and is even further removed from the latter to the south in Ecuador.

**16. *Prestonia parvifolia* K. Sch. spec. nov. in herb.**

Suffrutescens volubilis; ramulis gracilibus juventate pilosulis hirtellisve tandem glabratis haud conspicue lenticellatis; foliis ovalibus obovato-ellipticisve apice breviter acuminatis basi obtusis 5–7 cm. longis 2–4 cm. latis membranaceis opacis supra minute sparseque strigilloso-hirtellis subtus minute puberulis; petiolis 0.4–0.6 cm. longis puberulis; appendicibus stipulaceis intrapetiolaribus numerosis minute dentiformibus;



inflorescentiis corymbosis simplicibus 15-30-floris; pedunculo foliis brevior hirtello; pedicellis 0.7-1.0 cm. longis puberulis; bracteis obovato-ellipticis 0.7-1.0 cm. longis foliaceis sparse minuteque puberulo-papillatis; calycis laciniis obovato-ellipticis brevissime acuminatis 1.1-1.4 cm. longis foliaceis minute sparseque puberulo-papillatis squamellis deltoideis minute erosis; corollae salverformis virido-luteae extus sparse minuteque puberulo-papillatae tubo 1.6-1.8 cm. longo basi ca. 0.4 cm. diametro metiente appendicibus epistaminalibus paulo exsertis 0.25-0.3 cm. longis multo brevioribus quam antheris annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 0.9-1.0 cm. longis reflexis patulisve; antheris oblongo-sagittatis 0.5-0.55 cm. longis glabris; ovario ovoideo ca. 0.2 cm. longo glabro; stigmatibus 0.15-0.16 cm. longo; nectariis compressis oblongoideis basi plus minusve conerescentibus ovario paululo brevioribus; folliculis ignotis.

Stems relatively slender, pilosulose or hirtellous when young, glabrate but not conspicuously lenticellate when fully mature; leaves oval to obovate-elliptic, apex shortly acuminate, base obtuse, 5-7 cm. long, 2-4 cm. broad, membranaceous, opaque, above minutely and sparsely strigillose-hirtellous, beneath minutely puberulent; petioles 0.4-0.6 cm. long, puberulent; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence corymbose, simple, bearing 15-30 yellow flowers; peduncle somewhat shorter than the subtending leaves, hirtellous; pedicels 0.7-1.0 cm. long, somewhat accrescent after maturity, puberulent; bracts obovate-elliptic, 0.7-1.0 cm. long, conspicuously foliaceous, minutely and sparsely puberulent-papillate; calyx-lobes obovate-elliptic, very shortly acuminate, 1.1-1.4 cm. long, foliaceous, minutely and sparsely puberulent-papillate, the internal squamellae deltoid, minutely erose; corolla salverform, minutely puberulent-papillate without, the tube 1.6-1.8 cm. long, about 0.4 cm. in diameter at the base, epistaminal appendages slightly exserted, much surpassed by the anthers, 0.25-0.3 cm. long, the faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.9-1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers

oblong-sagittate, 0.5–0.55 cm. long, glabrous; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.15–0.16 cm. long; nectaries compressed-oblongoid, somewhat concrescent at the base, slightly shorter than the ovary; follicles unknown.

ECUADOR: MANABI: prope Hacienda El Recreo, May 6, 1895, *Eggers 15430* (B, TYPE, MBG, photograph and analytical drawings); in locis siccis, El Recreo, Sept., 1893, *Eggers 15430 bis* (M); GUAYAS: "Fl. Huayaquil," date lacking, *Pavon s.n.* (BB).

Similar to *P. velutina* in the approximate shape and size of the bracts and calyx-lobes, but differing notably in the shorter, barely exerted epistaminal appendages, more floriferous inflorescences, and puberulent-papillate corolla.

**17. *Prestonia perplexa* Woodson, spec. nov.**

Suffruticosa vel suffrutescens volubilis; ramulis gracilibus juventate minute hirtellis tandem glabratis inconspicue lenticellatis cortice rubro-brunneo; foliis ovato-ellipticis apice acuminatis basi obtusis 6–10 cm. longis 3–6 cm. latis rigide membranaceis supra juventate minutissime puberulis mox glabratis subtus glabris; petiolis 0.8–1.0 cm. longis glabris; appendicibus stipulaceis interpetiolaribus numerosis minute angustequedentiformibus; inflorescentiis subcorymbosis simplicibus 12–20-floris; pedunculo foliis subaequante vel paulo superante minute hirtello; pedicellis 1.2–1.5 cm. longis post maturitatem conspicue accrescentibus minute hirtellis; bracteis linearibus 0.1–0.4 cm. longis paululo foliaceis; calycis laciniis late obovato-ellipticis acutis acuminatisve 0.8–1.1 cm. longis foliaceis sparse indistincteque puberulo-papillatis squamellis late deltoideis minute emarginatis vel erosis; corollae salverformis dilute virido-luteae extus sparse minutissimeque papillatae tubo 1.3–1.5 cm. longo basi ca. 0.3 cm. diametro metiente appendicibus epistaminalibus haud vel vix exsertis 0.2–0.25 cm. longis multo brevioribus quam antheris annulo faucium conspicue incrassato lobis obovato-dolabriformibus haud acuminatis 0.6–0.8 cm. longis patentibus; antheris exsertis sagittatis 0.45 cm. longis glabris; ovario ovoideo ca. 0.1 cm. longo minutissime papillato; stigmatibus 0.175–0.2 cm. longo; nectariis com-

presse ovoideis basi connatis ovarium aequantibus; folliculis ignotis.

Stems relatively slender, minutely hirtellous when young, becoming glabrate and very inconspicuously lenticellate with a reddish-brown bark; leaves ovate-elliptic, apex acuminate, base obtuse, 6–10 cm. long, 3–6 cm. broad, firmly membranaceous, above very minutely puberulent when young, soon becoming glabrate, beneath glabrous; petioles 0.8–1.0 cm. long, glabrous; stipular appendages interpetiolar, minutely and narrowly dentiform; inflorescence subcorymbose, simple, bearing 12–20 pale greenish-yellow flowers; peduncle about equalling or slightly surpassing the subtending leaves, minutely hirtellous; pedicels 1.2–1.5 cm. long, conspicuously accrescent after maturity, minutely hirtellous; bracts linear, 0.1–0.4 cm. long, only slightly foliaceous; calyx-lobes broadly obovate-elliptic, acute to acuminate, 0.8–1.1 cm. long, conspicuously foliaceous, membranaceous, sparsely and indistinctly puberulent-papillate, the squamellae broadly deltoid, minutely emarginate or erose; corolla salverform, sparsely and very minutely papillate without, the tube 1.3–1.5 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages barely exerted or essentially included, much surpassed by the anthers, 0.2–0.25 cm. long, faucal annulus conspicuously thickened, the lobes obovate-dolabriform, not acuminate, 0.6–0.8 cm. long, reflexed or widely spreading; anthers inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, sagittate, 0.45 cm. long, glabrous, the tips conspicuously exerted; ovary ovoid, about 0.1 cm. long, very minutely papillate; stigma 0.175–0.2 cm. long; nectaries compressed-ovoid, united at the base, fleshy, about equalling the ovary; follicles unknown.

BRAZIL: DATA INCOMPLETE: *Lund s.n.* (C, TYPE, MBG, photograph and analytical drawings).

It is obviously dangerous, as well as exasperating, to base a species upon a single collection bearing no data but the name of the collector and merely the notation "Brasilia." Nevertheless, a taxonomic monograph is obliged to consider all material available however scanty and dubious as to origin. As the

majority of Brazilian Apocynaceae collected by Lund and bearing more exact data have been from the southeastern coastal states, it appears that the provenience of the type specimen of *P. perplexa* may rather safely be assigned to that general region, the states of Rio de Janeiro or São Paulo in particular.

The morphological characters of *P. perplexa* indicate a strong relationship to *P. parvifolia* of Ecuador, and to no other known species of its own regional flora. From the latter species, however, *P. perplexa* is amply distinct in such characters as the dimensions of the flower as well as those employed in the key.

**18. *Prestonia mollis* HBK. Nov. Gen. 3: 221. 1819.**

*Prestonia glabrata* HBK. loc. cit. 222. 1819; Miers, Apoc. So. Am. 145. 1878, not K. Sch.

*Haemadictyon molle* (HBK.) A. DC. in DC. Prodr. 8: 427. 1844.

*Haemadictyon glabratum* (HBK.) A. DC. loc. cit. 1844.

*Haemadictyon pallidum* A. DC. loc. cit. 428. 1844; Miers, loc. cit. 259. 1878.

*Haemadictyon tomentellum* Benth. Bot. Voy. Sulph. 126. 1844; Miers, loc. cit. 1878.

*Prestonia ecuadorensis* K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895.

*Prestonia Weberbaueri* Mgf. Notizblatt 9: 89. 1924.

Stems relatively slender, usually minutely puberulent or puberulent-papillate when young, soon becoming glabrate and rather conspicuously lenticellate; leaves broadly ovate to oblong-elliptic, apex shortly and abruptly acuminate to obtuse or rounded, base usually broadly and rather obscurely cordate to rounded or somewhat truncate, 4–15 cm. long, 2–9 cm. broad, membranaceous, above minutely and rather sparsely puberulent-papillate to glabrate or glabrous, beneath minutely tomentulose to glabrate or glabrous, usually paler and somewhat glaucescent; petioles 0.5–3.5 cm. long, minutely and rather sparsely puberulent-papillate to glabrate or glabrous; stipular appendages intrapetiolar, numerous, minutely dentiform-fla-

gelliform; inflorescence corymbose, simple, bearing 10–40 pale yellow flowers; peduncle somewhat shorter than the subtending leaves, very minutely puberulent to glabrous; pedicels 0.6–1.2 cm. long, somewhat accrescent after maturity, minutely puberulent to glabrous; bracts narrowly oblong-lanceolate, acuminate, 0.5–2.6 cm. long, conspicuously foliaceous, minutely papillate to glabrous; calyx-lobes narrowly oblong-lanceolate to linear, acuminate, 0.8–2.1 cm. long, conspicuously foliaceous, minutely papillate to glabrous without, the internal squamellae deltoid, minutely erose or lacerate; corolla salverform, glabrous or minutely papillate without, 2.2–3.4 cm. long, 0.4–0.5 cm. in diameter at the base, epistaminal appendages slightly exerted or at least attaining the orifice, 0.2–0.55 cm. long, the faucal annulus conspicuously thickened, the lobes obliquely obovate, usually shortly acuminate, occasionally obtuse, 1.7–2.5 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers narrowly sagittate, 0.6–0.8 cm. long, minutely hirtellous, rarely nearly glabrate, slightly exerted; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.15–0.2 cm. long; nectaries compressed-ovoid, separate or essentially so, about half equalling the ovary; follicles relatively stout, continuous, usually agglutinated and joined at the tips, 15–30 cm. long, glabrous; seeds 0.8–1.0 cm. long, the pale yellowish coma 3.5–4.0 cm. long.

ECUADOR: MANABI: prope Hacienda El Recreo, Aug. 4, 1893, *Eggers 14956* (B, M); GUAYAS: Insula Puna, May, 1892, *Eggers 14782* (B, M); prope Guayaquil, date lacking, *Sodiolo s.n.* (B); on Puna, 1852, *Andersson 79* (S); Guayaquil, 1852, *Andersson 79* (S); Guayaquil, date lacking, *Hartweg 670* (Camb., V); ad fluvium Daule prope Guayaquil, date lacking, *Spruce 6484* (B, BB, DL, V); oil camp between Guayaquil and Salinas, alt. 0–100 m., June 21–24, 1923, *Hitchcock 20069* (G, NY, US); Panigon Plantation, 8 miles south of Milagro, alt. 50 m., July 11–13, 1923, *Hitchcock 20593* (G, NY, US); DATA INCOMPLETE: *Warszewicz s.n.* (B); in *Andibus Ecuadorensibus*, 1857–9, *Spruce 6019* (BB, DC, DL, G, V).

PERU: AMAZONAS: Chachapoyas, 1862, *Matthews s.n.* (BB, NY); am Marañon bei Balsas, Uhrgehölz, gemischt aus Bäumen, Sträuchern, und hohen Rohrgräsern, alt. 920 m., June 24, 1904, *Weberbauer 4265* (B); CAJAMARCA: Tal des Marañon bei Bellavista, Regengrünes Gebüsch, gebildet aus hohen Sträuchern und kleinen Bäumen, alt. 500–600 m., Mai 2, 1912, *Weberbauer 6231* (B, G).

The specimens from northern Peru, representing roughly *P. Weberbaueri* Mgf., appear to be distinguished superficially



from the more typical specimens from farther north in having somewhat smaller leaves with less indication of the obscurely cordate base. However, enlisting all the specimens cited above in a rather uniform series of intergradations, it will be found that the extremes have been collected in the province of Guayas, Ecuador, alone. The type specimen of *P. Weberbaueri* (Weberbauer 6231 in herb. Berol.) is also distinguished by anthers approaching glabrescence. This character, however, is not shared by other specimens from Peru. Seen separately, the specimens cited appear to indicate need of segregation: when examined altogether, the unity of the species is apparent.

**19. *Prestonia didyma* (Vell.) Woodson, comb. nov.**

*Echites didyma* Vell. Fl. Flum. 109. 1830; Icon. 3: pl. 27. 1827; A. DC. in DC. Prodr. 8: 468. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 155. 1860.

*Haemadictyon membranaceum* Muell.-Arg. loc. cit. 167. 1860; Miers, Apoc. So. Am. 260. 1878.

*Rhaptocarpus didymus* (Vell.) Miers, loc. cit. 152. 1878.

Stems relatively stout, puberulent when young, glabrate and inconspicuously lenticellate when fully mature; leaves ovate-elliptic to rather narrowly oval, apex acuminate, base obtuse, 9-16 cm. long, 3.0-8.5 cm. broad, membranaceous, glabrous; petioles 1-2 cm. long; stipular appendages intrapetiolar, numerous, very minutely dentiform; inflorescence racemose, simple, bearing 10-20 rather livid greenish-yellow flowers; peduncle somewhat shorter than the subtending leaves, minutely puberulent; pedicels 1.5-2.1 cm. long, somewhat accrescent after maturity, minutely puberulent; bracts linear, 0.3-0.4 cm. long, very slightly foliaceous; calyx-lobes elliptic-lanceolate, acuminate, 1.2-1.8 cm. long, green, faintly flushed with purple toward the base, glabrous, the internal squamellae deltoid-trigonal, minutely emarginate or erose; corolla salverform, glabrous or minutely papillate without, the tube 0.8-1.5 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages wholly included, about 0.2 cm. long, the faucal annulus conspicuously thickened, the lobes obliquely obovate,



0.75–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers very narrowly sagittate, about 0.6 cm. long, glabrous, slightly exserted; ovary ovoid, about 0.1 cm. long, glabrous; stigma 0.15 cm. long; nectaries compressed-ovoid, conspicuously conerescent at the base, somewhat surpassing the ovary; follicles relatively stout, continuous, usually united at the tips and somewhat agglutinated, 20–25 cm. long, glabrous; seeds 1.0–1.1 cm. long, the pale yellowish coma 3.0–3.5 cm. long.

BRAZIL: RIO GRANDE DO NORTE: Taipu, date lacking, *Schott 5389* (V, TYPE, MBG, photograph and analytical drawings); RIO DE JANEIRO: ad urbem loco Fortaleza São João, March 25, 1916, *Frasão 7144* (B); DATA INCOMPLETE: *Sellow s.n.* (B).

The foundation of this transfer appears to be well established through a technical examination of Velloso's plate of a plant collected "in sylvis maritimis" in the vicinity of Rio de Janeiro. Velloso's illustrations, although often almost comically wooden and lifeless, frequently portray with surprising aptitude basic characteristics of the species depicted. In this respect they may be comparable to modern "cartoons."

20. *Prestonia annularis* (L. f.) G. Don, Gen. Hist. 4: 84. 1838.

*Echites annularis* L. f. Suppl. 166. 1781.

*Haemadictyon ? annulare* (L. f.) A. DC. in DC. Prodr. 8: 428. 1844.

*Temnadenia annularis* (L. f.) Miers, Apoc. So. Am. 216. 1878.

Plants completely glabrous; stems relatively stout, conspicuously lenticellate when fully mature; leaves broadly ovate to oblong-elliptic, apex obtuse to acute, base obtuse to rounded, 14–27 cm. long, 4.5–12.0 cm. broad, subcoriaceous, opaque; petioles 0.7–2.0 cm. long; stipular appendages intra- or interpetiolar, numerous, minutely dentiform-flagelliform; inflorescence racemose, dichotomous, bearing 10–30 purplish-yellow flowers; peduncle much shorter than the subtending leaves; pedicels 1.1–1.3 cm. long, somewhat accrescent after maturity; bracts linear, about 0.1 cm. long, scarious or only slightly foliaceous; calyx-lobes oblong-elliptic, acute to acuminate, 0.7–1.0 cm. long, subcoriaceous, pale green suffused with purple, gla-

brous without, the internal squamellae deltoid-ligular, minutely erose or truncate; corolla salverform, glabrous or very minutely papillate without, the tube 1.3–1.5 cm. long, about 0.25 cm. in diameter at the base, epistaminal appendages wholly included, about 0.15 cm. long, the faucal annulus conspicuously thickened, the lobes obliquely obovate-dolabriform, 0.8–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers oblong-sagittate, 0.45–0.5 cm. long, minutely puberulent-papillate dorsally, slightly exserted; ovary ovoid, about 0.1 cm. long, glabrous; stigma 0.1–0.15 cm. long; nectaries compressed-ovoid, separate or somewhat concrescent at the base, about equalling the ovary; follicles relatively long and stout, continuous, usually somewhat falcate and frequently united at the tips, 40–45 cm. long, glabrous; seeds 1.2–1.4 cm. long, the pale yellowish coma 3.5–4.0 cm. long.

DUTCH GUIANA: e regione Para, 1851, *Wulschlägel 1028* (Bx); Jaglust, fluv. Suriname, in silva, June 26, 1913, *Alprato 40E* (U); Paramaribo, date lacking, *Focke 1056* (U); Paramaribo, June 25, 1850, *Wulschlägel 1028* (U, V); data incomplete, *Hostmann & Kappler s.n.* (S).

**21. *Prestonia guianensis* Gleason, Bull. Torrey Bot. Club 53: 299. 1926.**

Plants completely glabrous; stems relatively stout, conspicuously lenticellate when fully mature; leaves oval to oblong-elliptic, apex acuminate, base obtuse to rounded, 10–13 cm. long, 4.5–6.0 cm. broad, subcoriaceous, opaque; petioles 0.7–1.0 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence racemose, dichotomous, bearing 30–40 cream-colored flowers; peduncle equalling or somewhat surpassing the subtending leaves; pedicels 0.8–1.0 cm. long, somewhat accrescent after maturity; bracts linear, scarious, less than 0.1 cm. long; calyx-lobes oblong-elliptic, acute to acuminate, membranaceous or nearly subcoriaceous, 0.9–1.0 cm. long, green suffused with purple, the internal squamellae broadly deltoid-dentiform, truncate or very minutely erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.2–1.4 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages wholly included, about 0.07–0.1

cm. long, fauceal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 1.0–1.25 cm. long; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers elliptic-sagittate, 0.5–0.55 cm. long, puberulent-papillate dorsally, slightly exserted; ovary ovoid, about 0.1 cm. long, glabrous; stigma 0.08–0.1 cm. long; nectaries compressed-ovoid, separate or slightly conerescent at the base, equalling the ovary; follicles unknown.

BRITISH GUIANA: Pomeroon River, Pomeroon District, Dec. 17–24, 1922, *Crus* 3097 (G, NY, TYPE, MBG, photograph and analytical drawings).

Although this species is closely related to *P. annularis* of adjoining Dutch Guiana, it seems distinct because of its thicker foliage, as well as its longer corolla-lobes which appear nearly white, and longer inflorescence with longer floriferous branches and shorter sterile primary peduncle.

**22. *Prestonia purpurissata* Woodson, spec. nov.**

Suffruticosa volubilis; ramulis crassiusculis maturitate glabris conspicue lenticellatis; foliis ovalibus oblongo-ellipticisve apice breviter acuminatis obtusisve basi obtusis vel rotundatis 9–15 cm. longis 3.0–6.5 cm. latis firme membranaceis opacis omnino glabris; petiolis 0.5–1.0 cm. longis; appendicibus stipulaceis interpetiolaribus numerosis minute dentiforme-flagelliformibus; inflorescentiis subcorymbosis di- vel trichotome divis floribus 20–40 purpurissatos gerentibus; pedunculo foliis subaequante; pedicellis 1.3–1.5 cm. longis post maturitatem paulo accrescentibus minutissime papillatis; bracteis linearibus 0.1–0.4 cm. longis scariaceis; calycis laciniis oblongo-lanceolatis acuminatis 1.7–1.8 cm. longis membranaceis sat purpurissatis squamellis dentiformibus emarginatis vel paulo laceratis; corollae salverformis extus glabrae vel minutissime papillatae tubo 1.7–1.9 cm. longo basi ca. 0.35 cm. diametro metiente appendicibus epistaminilibus omnino inclusis ca. 0.1 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis acuminatis 1.0–1.2 cm. longis patentibus; antheris pandurate sagittatis 0.6 cm. longis dorso minute papillatis paulo exsertis; ovario ovoideo ca. 0.2 cm. longo glabro; stigmatibus ca. 0.15 cm. longo; nectariis compressis oblongoideis integris vel basi paul-

lulo conerescentibus ovarium paulo superantibus; folliculis ignotis.

Plants completely glabrous; stems relatively stout, glabrous and conspicuously lenticellate when fully mature; leaves oval to oblong-elliptic, apex obtuse or shortly acuminate, base obtuse or rounded, 9–15 cm. long, 3.0–6.5 cm. broad, firmly membranaceous, opaque; petioles 0.5–1.0 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform-flagelliform; inflorescence subcorymbose, di- or trichotomous, bearing 20–40 “raisin-purple” flowers; peduncle about equalling the subtending leaves; pedicels 1.3–1.5 cm. long, somewhat accrescent after maturity, very minutely papillate; bracts linear, 0.1–0.4 cm. long, scarious; calyx-lobes oblong-lanceolate, acuminate, 1.7–1.8 cm. long, membranaceous, conspicuously flushed with purple, the internal squamellae dentiform, emarginate or slightly erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.7–1.9 cm. long, about 0.35 cm. in diameter at the base, epistaminal appendages wholly included, about 0.1 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, acuminate, 1.0–1.2 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers sagittate, somewhat pandurate, 0.6 cm. long, minutely papillate dorsally, slightly exserted; ovary ovoid, about 0.2 cm. long, glabrous; stigma about 0.15 cm. long; nectaries compressed-oblongoid, separate or somewhat concrescent at the base, slightly surpassing the ovary; follicles unknown.

COLOMBIA: EL VALLE: edge of forest, La Cumbre, alt. 1650–1850 m., May 14–19, 1922, Pennell 5719 (US, TYPE, MBG, photograph and analytical drawings).

Differs from its immediate relatives, *P. finitima* and *P. Phenax* superficially in its longer, delicately petalaceous calyx-lobes.

### 23. *Prestonia finitima* Woodson, spec. nov.

Suffruticosa volubilis; ramulis crassiusculis juventate minute puberulis maturitate glabratis inconspicueque lenticellatis; foliis ellipticis apice acuminatis basi obtusis 9–25 cm. longis 3.0–11.0 cm. latis tenuiter membranaceis opacis juven-

tate minute sparseque puberulis mox glabratis; petiolis 1.3–2.5 cm. longis; appendicibus stipulaceis interpetiolaribus minute dentiforme-flagelliformibus; inflorescentiis subcorymbosis dichotome divisis flores 15–20 lutescentes gerentibus; pedunculo foliis paulo brevior; pedicellis 1.4–1.5 cm. longis, post maturitatem paulo accrescentibus indistincte papillatis; bracteis minutissimis vix bene visis; calycis laciniis late oblongo-ellipticis breviter acuminatis 1.2–1.4 cm. longis subcoriaceis purpurissatis glabris vel indistinctissime papillatis squamellis latissime deltoideis erosis; corollae salverformis extus indistincte papillatae tubo 1.8–1.9 cm. longo basi ca. 0.4 cm. diametro metiente prope fauces sensim angustato appendicibus epistaminalibus omnino inclusis ca. 0.1 cm. longis annulo faucium conspicue incrassato lobis oblique-obovatis breviter acuminatis 0.7–1.0 cm. longis patentibus; antheris pandurate sagittatis 0.5 cm. longis dorso puberulo-papillatis paulo exsertis; ovario ovoideo ca. 0.15 cm. longo glabro; stigmatibus 0.15–0.2 cm. longo; nectariis compresse-oblongoideis ovarium paulo superantibus prope basem connatis apice truncatis vel leviter undulatis; folliculis ignotis.

Stems relatively stout, minutely puberulent when young, glabrate and inconspicuously lenticellate when fully mature; leaves elliptic, apex acuminate, base obtuse, 9–25 cm. long, 3.0–11.0 cm. broad, delicately membranaceous, minutely and sparsely puberulent when young, soon becoming glabrate; petioles 1.3–2.5 cm. long, glabrous; stipular appendages interpetiolar, numerous, minutely dentiform-flagelliform; inflorescence subcorymbose, dichotomous, bearing 15–20 brownish-yellow flowers; peduncle somewhat shorter than the subtending leaves, glabrous; pedicels 1.4–1.5 cm. long, somewhat accrescent after maturity, indistinctly papillate; bracts very minute, scarcely visible; calyx-lobes broadly oblong-elliptic, shortly acuminate, 1.2–1.4 cm. long, subcoriaceous, suffused with purple, glabrous or very indistinctly papillate, the internal squamellae very broadly deltoid, erose; corolla salverform, indistinctly papillate without, the tube 1.8–1.9 cm. long, about 0.4 cm. in diameter at the base, gradually constricting toward the orifice, epistaminal appendages wholly included, about 0.1



cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers pandurately sagittate, 0.5 cm. long, puberulent-papillate dorsally, slightly exserted; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.15–0.2 cm. long; nectaries compressed-oblongoid, slightly surpassing the ovary, connate toward the base, the apices truncate or slightly undulate; follicles unknown.

BRAZIL: AMAZONAS: Suhinya, Sept. 1, 1912, *Koch-Gruenberg* 30 (B, TYPE, MBG, photograph and analytical drawings); Municipality Humayta, near Tres Casas, on varzea land, Sept. 14–Oct. 11, 1934, *Krukoff* 6190 (NY).

There is a very obvious danger in depending too trustingly upon collectors' notes concerning flower color in the majority of cases, without doubt. In the instance of the species centering about *P. Phenax* and *P. trifida*, however, the collector's report of the flower color has been found to coincide with certain morphological characters used in the delimitation of species. Furthermore in the case of species represented by several specimens with flower color noted, sufficient unanimity has been found to use such observations in descriptions, and to a less extent in keys. It is thought that such notes may be of use in identification, particularly when fresh material may be available.

**24. *Prestonia Phenax* Woodson, spec. nov.**

Suffruticosa volubilis; ramulis crassiusculis maturitate glabris conspicue lenticellatis; foliis late ovatis vel late oblongo-ellipticis apice acuminatis rariusve obtusiusculis basi obtusis vel rotundatis 10–28 cm. longis 4–14 cm. latis subcoriaceis opacis glabris; petiolis 0.8–2.0 cm. longis glabris; appendicibus stipulaceis interpetiolaribus numerosis minute dentiformibus; inflorescentiis corymbosis di- vel trichotome divisis flores viridi-luteos 10–30 gerentibus; pedunculo foliis multo brevior; pedicellis 1.0–1.3 cm. longis glabris post maturitatem paulo accrescentibus; bracteis linearibus minutis vix bene visis; calycis laciniis oblongo-ellipticis apice acutis vel breviter acuminatis 1.2–1.3 cm. longis membranaceis vel subcoriaceis

viridibus basi apiceque purpurissatis glabris squamellis late deltoideis minute emarginatis integrisve; corollae salverformis extus glabrae vel minutissime papillatae tubo 1.5–1.7 cm. longo basi ca. 0.3–0.4 cm. diametro metiente appendicibus epistaminalibus omnino inclusis ca. 0.1–0.2 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 0.8–1.2 cm. longis patentibus; antheris sagittatis paulo panduratis 0.5 cm. longis dorso minute puberulo-papillatis paulo exsertis; ovario ovoideo ca. 0.15 cm. longo glabro; stigmate 0.15–0.2 cm. longo; nectariis compresse oblongo-ovoideis integris vel basi concrescentibus ovarium paulo superantibus; folliculis juvenate gracilibus continuis falcatis apice connatis; seminibus ignotis.

Plants completely glabrous; stems relatively stout, conspicuously lenticellate when fully mature; leaves broadly ovate to oblong-elliptic, apex acuminate to somewhat obtuse, base obtuse or rounded, 10–28 cm. long, 4–14 cm. broad, subcoriaceous, opaque; petioles 0.8–2.0 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence corymbose, di- or trichotomous, bearing 10–30 greenish-yellow, brown-tinted flowers; peduncle much shorter than the subtending leaves; pedicels 1.0–1.3 cm. long, somewhat accrescent after maturity; bracts linear, minute, very inconspicuous; calyx-lobes oblong-elliptic, acute or shortly acuminate, 1.2–1.3 cm. long, membranaceous or subcoriaceous, green tinted with purple at base and tip, glabrous, the internal squamellae broadly deltoid, entire or minutely emarginate; corolla salverform, glabrous or minutely papillate without, the tube 1.5–1.7 cm. long, about 0.3–0.4 cm. in diameter at the base, epistaminal appendages wholly included, 0.1–0.2 cm. long, faecal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.8–1.2 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers oblong-sagittate, somewhat pandurate, 0.5 cm. long, minutely puberulent-papillate dorsally, slightly exserted; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.15–0.2 cm. long; nectaries compressed oblong-ovoid, separate or somewhat united at the base,

somewhat surpassing the ovary; immature follicles relatively slender, continuous, falcate, united at the apex; seeds unknown.

PERU: LORETO: Urwald, Stromgebiet des Ucayali von 10° S. bis zur Mündung, July 26, 1923, *Tessmann 3046* (B, TYPE, MBG, photograph and analytical drawings); edge of water, Fortaleza, Yurimaguas, Oct.-Nov., 1929, *Williams 4310* (B, FM).

BOLIVIA: SANTA CRUZ: barranca en el bosque, Rio Surutu, alt. 400 m., Oct. 8, 1925, *Steinbach 7272* (B).

*Williams 4310* may be found to represent another species or variety, since it differs from the other specimens cited in having somewhat smaller, narrower leaves, and more conspicuously purplish calyx. *Tessmann 3046* and *Steinbach 7272* from widely separate localities, however, show striking uniformity in all observable characters.

**25. *Prestonia Brittonii* N. E. Br. Bull. Torrey Bot. Club 51: 5. 1924.**

Plants completely glabrous; stems relatively stout, conspicuously lenticellate when fully mature; leaves oval, apex shortly acuminate, base obtuse or rounded, 13-16 cm. long, 7-9 cm. broad, rigidly membranaceous to subcoriaceous, opaque; petioles 1.5-2.5 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform-flagelliform; inflorescence corymbose, repeatedly dichotomous, bearing 40-50 brownish-yellow flowers; peduncle much surpassing the subtending leaves; pedicels 1.7-2.1 cm. long, somewhat accrescent after maturity; bracts minutely ovate-lanceolate, very inconspicuous; calyx-lobes oblong-elliptic, apex acute to shortly acuminate, 1.0-1.25 cm. long, subcoriaceous, deep purple, glabrous or very indistinctly papillate, the internal squamellae broadly deltoid, minutely erose; corolla salverform, glabrous without, the tube 1.5-1.8 cm. long, about 0.35 cm. in diameter at the base, very slightly constricting toward the orifice, epistaminal appendages deeply included, 0.15 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.8-0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers oblong-sagittate, somewhat pandurate, 0.5 cm. long,

minutely puberulent-papillate dorsally, slightly exserted; ovary ovoid, about 0.1 cm. long, glabrous; stigma 0.15 cm. long; nectaries compressed-oblongoid, separate or slightly conrescent at the base, apex truncate or minutely emarginate, equaling or slightly surpassing the ovary; follicles unknown.

TRINIDAD: Heights of Aripo, Jan. 10-26, 1922, *Broadway 10009* (NY, ISOTYPE, MBG, photograph and analytical drawings).

**26. *Prestonia laxa* Rusby, spec. nov. in herb.**

Suffruticosa volubilis; ramulis gracilibus juventate minute sparseque puberulis maturitate glabratis inconspicue lenticellatis; foliis oblongo-ellipticis apice breviter acuminatis basi obtusis rotundatisve 9-19 cm. longis 2.7-7.5 cm. latis rigide membranaceis vel subcoriaceis opacis vel supra paululo nitidulis; petiolis 0.5-0.8 cm. longis; appendicibus stipulaceis interpetiolaribus numerosis minute dentiformibus; inflorescentiis corymbosis dichotome subdivisis flores 10-40 albidos carneo-maculatos gerentibus; pedunculo folia multo superante; pedicellis 1.5-2.0 cm. longis post maturitatem paulo accrescentibus minutissime papillatis; bracteis linearibus 0.1-0.2 cm. longis scariaceis; calycis laciniis oblongo-ellipticis apice breviter acuminatis 1.0-1.4 cm. longis tenuiter membranaceis viridi-purpurissatis extus glabris vel minutissime papillatis squamellis dentiforme-trigonalibus; corollae salverformis extus glabrae tubo 1.8-2.3 cm. longo basi ca. 0.4 cm. diametro metiente appendicibus epistaminalibus paulo exsertis ca. 0.5 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 0.7-0.8 cm. longis patentibus; antheris oblongo-sagittatis paulo panduratis 0.5-0.55 cm. longis dorso minute puberulo-papillatis paulo exsertis; ovario ovoideo ca. 0.2 cm. longo glabro; stigmatibus 0.15 cm. longo; nectariis compresse ovoideis integris vel basi plus minusve connatis ovario brevioribus; folliculus juventate gracilibus continuis falcatis glabris; seminibus ignotis.

Stems relatively slender, sparsely and minutely puberulent when young, glabrate and inconspicuously lenticellate when fully mature; leaves oblong-elliptic, apex shortly acuminate, base obtuse to rounded, 9-19 cm. long, 2.7-7.5 cm. broad, rigidly

membranaceous to subcoriaceous, opaque or somewhat nitidulous above, glabrous; petioles 0.5–0.8 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence corymbose, dichotomously subdivided, bearing 10–40 white, crimson-blotched flowers; peduncle much surpassing the subtended leaves; pedicels 1.5–2.0 cm. long, somewhat accrescent after maturity, minutely papillate; bracts linear, 0.1–0.2 cm. long, scarious; calyx-lobes oblong, elliptic, shortly acuminate, 1.0–1.4 cm. long, delicately membranaceous, greenish-purple, glabrous or very minutely papillate without, the internal squamellae dentiform-trigonal; corolla salverform, glabrous without, the tube 1.8–2.3 cm. long, about 0.4 cm. in diameter at the base, epistaminal appendages slightly exserted, about 0.5 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–0.8 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, slightly pandurate, 0.5–0.55 cm. long, minutely puberulent-papillate dorsally, slightly exserted; ovary ovoid, about 0.2 cm. long, glabrous; stigma about 0.15 cm. long; nectaries compressed-ovoid, separate or somewhat connate at the base, somewhat shorter than the ovary; immature follicles relatively slender, continuous, falcate, glabrous; seeds unknown.

COLOMBIA: MAGDALENA: edge of mountain forest and clearing below Valparaiso, alt. 4000 ft., March 26, 1899, *H. H. Smith 1647* (NY, TYPE, G, MBG, photograph and analytical drawings); Bergenwald, Sierra Nevada de Santa Marta, July 9, 1926, *Schultze 474* (B).

The color of the corolla is described by Smith as "whitish blotched with crimson around the throat," and by Schultze as "rotlich weiss, innen schneeweiss dunkelkarmin rot gezeichnet. Der Ring goldgelb."

**27. *Prestonia rotundifolia* K. Sch. spec. nov. in herb.**

Suffruticosa volubilis; ramulis juventate minute puberulis maturitate glabris conspicue lenticellatis; foliis late ovalibus vel late obovato-ovalibus apice obtusis rotundatisve saepius minute mucronatis basi rotundatis 9.5–17.5 cm. longis 4.5–10.0 cm. latis rigide membranaceis opacis glabris; petiolis 0.6–1.6



cm. longis glabris; appendicibus stipulaceis intrapetiolaribus multis minute dentiforme-flagelliformibus; inflorescentiis corymbosis subumbellatis obscure di- vel trichotome divisus flores 8–20 luteos gerentibus; pedunculo foliis multo brevior; pedicellis 1.1–1.2 cm. longis minute appresseque puberulis; bracteis anguste elliptico-oblongeolatis 0.65–1.2 cm. longis plus minusve petalaceis purpurissatis caducis; calycis laciniis oblongo-ellipticis breviter acuminatis 0.9–1.1 cm. longis subcoriaceis purpurissatis extus minutissime appresseque puberulo-papillatis squamellis dentiforme-deltoides minutissime erosis; corollae salverformis extus minute papillatae tubo 1.5–1.7 cm. longo basi ca. 0.35 cm. diametro metiente appendicibus epistaminalibus faucibus paene attingentibus ca. 0.25 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 1.0–1.3 cm. longis patentibus; antheris anguste oblongo-sagittatis paulo panduratis 0.45–0.5 cm. longis glabris paulo exsertis; ovario ovoideo ca. 0.2 cm. longo glabro; stigmate 0.15 cm. longo; nectariis compressis oblongo-ovoideis integris vel basi plus minusve connatis apice truncatis ovarium aequantibus vel paullulo superantibus; folliculis ignotis.

Stems relatively stout, minutely puberulent when young, glabrate and conspicuously lenticellate when fully mature; leaves broadly oval to broadly obovate-oval, apex obtuse or rounded, frequently very shortly mucronulate, base rounded, 9.5–17.5 cm. long, 4.5–10.0 cm. broad, firmly membranaceous, opaque, glabrous; petioles 0.6–1.6 cm. long, glabrous; stipular appendages intrapetiolar, numerous, dentiform-flagelliform; inflorescence corymbose or subumbelate, obscurely di- or trichotomous, bearing 8–20 yellow flowers; peduncle much shorter than the subtending leaves; pedicels 1.1–1.2 cm. long, somewhat accrescent after maturity, minutely appressed-puberulent; bracts narrowly elliptic-oblongeolate, 0.65–1.2 cm. long, more or less petalaceous, purplish, caducous; calyx-lobes oblong-elliptic, shortly acuminate, 0.9–1.1 cm. long, subcoriaceous, purplish, without minutely appressed puberulent, the internal squamellae dentiform-deltoid, very minutely erose; corolla salverform, minutely papillate without, the tube 1.5–1.7 cm.

long, about 0.35 cm. in diameter at the base, epistaminal appendages barely attaining the faucal annulus, about 0.25 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 1.0–1.3 cm. long, reflexed or spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers narrowly oblong-sagittate, slightly pandurate, 0.45–0.5 cm. long, glabrous, slightly exserted; ovary ovoid, about 0.2 cm. long, glabrous; stigma about 0.15 cm. long; nectaries compressed oblong-ovoid, separate or slightly connate at the base, apex truncate, about equalling or very slightly surpassing the ovary; follicles unknown.

ECUADOR: MANABI: in fruticetis siccis, El Recreo, Aug., 1893, *Eggers 15078* (M, TYPE, MBG, photograph and analytical drawings); GUAYAS: Toachi, alt. 400–860 m., Dec., 1883, *Sodiro 106/1* (B).

Distinguished from *P. trifida* by the peculiar, petalaceous bracts.

**28. *Prestonia robusta* Rusby, Descr. So. Am. Pl. 91. 1920.**

Stems relatively stout, glabrous and conspicuously lenticellate when fully mature; leaves broadly oval to obovate-oval, apex obtuse or rounded to very abruptly and shortly acuminate, base obtuse to rounded, 10–21 cm. long, 5.5–12.5 cm. broad, subcoriaceous, opaque, glabrous; petioles 1.4–1.6 cm. long, glabrous; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence corymbose or subumbellate, obscurely di- or trichotomously compound, bearing 10–20 greenish-white or yellowish flowers; peduncle much shorter than the subtending leaves, glabrous to very sparsely puberulent; pedicels 0.4–0.9 cm. long, somewhat accrescent after maturity, minutely puberulent-papillate; bracts oval to elliptic, 0.3–0.5 cm. long, somewhat foliaceous or tinted with purple, caducous; calyxlobes oval to broadly oblong-elliptic, acute to acuminate, 1.0–1.5 cm. long, coriaceous or subcoriaceous, somewhat suffused with purple, sparsely and minutely puberulent-papillate without, the internal squamellae dentiform-ligular, truncate or slightly erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.3–1.5 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages slightly exserted,

0.25–0.3 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.8–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers narrowly sagittate, 0.55 cm. long, glabrous or essentially so; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.12–0.15 cm. long; nectaries compressed-ovoid, separate or slightly connate at the base, about equalling the ovary; follicles unknown.

BOLIVIA: LA PAZ: Tumupasa, alt. 1800 ft., Dec. 15, 1901, *R. S. Williams 571* (NY, TYPE, MBG, photograph and analytical drawings); SANTA CRUZ: bosque, Buenavista, alt. 400 m., Dec. 30, 1925, *Steinbach 7376* (B); Montecito de Fuca, Buenavista, alt. 450 m., Sept. 29, 1916, *Steinbach 2863* (B).

**29. *Prestonia macroneura* (Muell.-Arg.) Woodson, comb.**

LOV.

*Haemadictyon macroneurum* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 169. 1860; Miers, Apoc. So. Am. 262. 1878.

Plants completely glabrous; stems relatively stout, conspicuously lenticellate when fully mature; leaves broadly oval, apex obtuse to very shortly acuminate, base obtuse to rounded, 12–15 cm. long, 7–9 cm. broad, firmly membranaceous, opaque; petioles 0.5–0.8 cm. long; stipular appendages intrapetiolar, numerous, minutely dentiform; inflorescence densely subumbellate-capitate, simple or very obscurely compound, bearing 15–20 congested, reddish flowers tinged with purple, yellow, and white; peduncle much shorter than the subtending leaves; pedicels 0.3–1.0 cm. long, somewhat accrescent after maturity; bracts oval to oblong-lanceolate, acute to acuminate, 0.4–1.0 cm. long, foliaceous, persistent; calyx-lobes oval to broadly elliptic, acuminate, 0.9–1.1 cm. long, green slightly tinged with purple at the base, the internal squamellae deltoid, minutely lacerate; corolla salverform, glabrous or very minutely papillate without, the tube 1.3–1.5 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages slightly exerted, about 0.4 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers sagittate, about 0.5 cm. long,

glabrous, slightly exerted; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.1–0.15 cm. long; nectaries compressed oblong-ovoid, separate or somewhat conerescent at the base, equalling or slightly surpassing the ovary; follicles unknown.

BRAZIL: AMAZONAS: in sepibus ad Porto dos Juris prope Cataract. Capatenses, Dec., year lacking, *Martius 3029* (M, TYPE, V, MBG, photograph and analytical drawings).

An examination of Vellozo's illustration of *Echites denticulata* (Icon. 3: pl. 30. 1830), a species with elongate inflorescence and inconspicuous bracts, does not appear to ally that plant with *Martius*' specimen, as indicated in *Mueller*'s synonymy. The description of the color of the corolla has been adapted from *Mueller*.

30. *Prestonia trifida* (Poepp.) Woodson, in Gleason & A. C. Smith, Bull. Torrey Bot. Club 60: 392. 1933.

*Haemadictyon trifidum* Poepp. Nov. Gen. 3: 67. pl. 275. 1845; Miers, Apoc. So. Am. 261. 1878.

*Prestonia* (*Haemadictyon*) *Evansii* S. Moore, Trans. Linn. Soc. Bot. II. 4: 395. 1895.

*Prestonia glabrata* K. Sch. Verhandl. Bot. Ver. Brandenburg 47: 189. 1905, not HBK.

Stems relatively stout, inconspicuously puberulent when very young, soon becoming glabrate and conspicuously lenticellate; leaves broadly ovate to broadly oval, apex very abruptly and shortly acuminate to obtuse, base broadly obtuse-rounded, 9–31 cm. long, 4.5–14.5 cm. broad, coriaceous or subcoriaceous, opaque or slightly nitidulous above, somewhat glaucescent beneath, glabrous; petioles 0.8–2.5 cm. long, glabrous; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence corymbose, tri- or rarely dichotomous, bearing 15–30 yellow flowers; peduncle much shorter than the subtending leaves, very minutely puberulent to glabrate; pedicels 0.6–1.8 cm. long, very minutely puberulent-papillate to glabrate, somewhat accrescent after maturity; bracts very minute, broadly ovate-dentiform to ovate-lanceolate, scarious, persistent; calyxlobes oblong-elliptic, acute to very shortly acuminate, 0.9–1.5 cm. long, coriaceous, minutely appressed-puberulent to pu-

berulent-papillate, more or less strongly suffused with purple, the internal squamellae deltoid, minutely erose or lacerate; corolla salverform, glabrous to minutely puberulent-papillate without, the tube 1.5–1.8 cm. long, about 0.35 cm. in diameter at the base, epistaminal appendages slightly exserted, 0.2–0.4 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers oblong-sagittate, slightly pandurate, 0.5–0.6 cm. long, glabrous, slightly exserted; ovary ovoid, about 0.125 cm. long, glabrous, stigma 0.1–0.15 cm. long; nectaries compressed ovoid, separate or more or less connate at the base, about equalling the ovary; follicles unknown.

COLOMBIA: CHOCO: between La Oveja and Quibdo, April 1–2, 1931, *Archer 1749* (US).

PERU: LORETO: forest, Mishuyacu, near Iquitos, alt. 100 m., Jan., 1930, *Klug 774* (FM, US); same locality, Febr.–March, 1930, *Klug 915* (FM, US); Tarapoto, Dec., 1902, *Ule 6604* (B, DL); silva non inundata, Rio Huallaga, Yurimaguas, Febr. 11, 1924, *Kuhlmann 21851* (B); Tarapoto, alt. 150 m., Dec., 1929, *L. Williams 6049* (FM); Maynas, silvae primaevae, Febr., 1831, *Poeppig 2161* (V, TYPE, MBG, photograph and analytical drawings).

BRAZIL: MATTO GROSSO: ad ripas fl. Paraguay inter Santa Cruz et Villa Maria, Dec., 1891, *Moore 819* (B, NY, MBG, photograph and analytical drawings); near source of the Jatuarana River, Machado River region, *Krukoff 1545* (NY).

### 31. *Prestonia vana* Woodson, spec. nov.

Fruticosa volubilis ut creditur; ramulis gracilibus maturitate glabris conspicue lenticellatis; foliis late ovalibus apice rotundatis breviter acuminato-mucronatis basi late obtusis rotundatisve 13–16 cm. longis 8.0–9.5 cm. latis coriaceis subcoriaceisve glaberrimis opacis superne paulo lucentibus; petiolis 1.0–1.2 cm. longis glabris; appendicibus stipulaceis intrapetiolaribus pectinatis numerosis; inflorescentiis corymbosis flores 20–25 speciosos viridi-lutescentes rubicundos gerentibus; pedunculi dichotomi foliis bis terve brevioris partibus florigeris minute denseque puberulis sterilibus glabris; pedicellis 1.7–2.0 cm. longis minute denseque puberulis; bracteis ovato-lanceolatis 0.2–0.3 cm. longis scariaceis haud caducis; calycis laciniis oblongo-ellipticis apice acute acuminatis 1.2–1.3 cm. longis subcoriaceis viridibus vel paulo purpurissatis extus minute



sparseque puberulis intus glabris squamellis profunde irregulariterque laceratis; corollae salverformis tubo 1.5-1.6 cm. longo basi ca. 0.25 cm. diametro metiente extus minute velutino intus prope insertionem staminum molliter puberulo caeterumque glabro appendicibus epistaminalibus linearibus ca. 0.4-0.45 cm. longis valde exsertis annulo faucium conspicue incrassato lobis oblique obovato-dolabriformibus conspicue acuminatis 0.7-0.8 cm. longis patentibus; antheris oblongo-sagittatis 0.5 cm. longis dorso minute denseque puberulis apice exsertis; ovario ovoideo ca. 0.125 cm. longo sparse minuteque pilosulo; stigmatate subcapitato-maniculato ca. 0.15 cm. longo; nectariis incrassatis compresse ovoideis ovarium paulo superantibus; folliculis ignotis.

Stems somewhat slender, glabrous, conspicuously lenticellate at maturity; leaves broadly oval, apex rounded, usually acuminate-mucronate, base broadly obtuse to rounded, 13-16 cm. long, 8.0-9.5 cm. broad, coriaceous to subcoriaceous, glabrous, opaque, or the upper surface somewhat shining; petioles 1.0-1.2 cm. long, glabrous; stipular appendages intrapetiolar, pectinate, numerous; inflorescence corymbose, bearing 20-25 showy, greenish-yellow, red-flushed flowers; peduncle twice to thrice shorter than the subtending leaves, the floriferous branches minutely and densely puberulent, the sterile axis glabrous; pedicels 1.7-2.0 cm. long, minutely and densely puberulent; bracts ovate-lanceolate, 0.2-0.3 cm. long, scarious or very slightly foliaceous when very young, persistent; calyxlobes oblong-elliptic, apex acutely acuminate, 1.2-1.3 cm. long, subcoriaceous, green or very slightly suffused with purple, without minutely and rather sparsely puberulous, within glabrous, the squamellae deeply and irregularly lacerate; corollatube 1.5-1.6 cm. long, about 0.25 cm. in diameter at the base, minutely velutinous without, softly puberulent within about the insertion of the stamens, epistaminal appendages linear, 0.4-0.45 cm. long, conspicuously exserted, faucal annulus conspicuously thickened, the lobes obliquely obovate-dolabriform, conspicuously acuminate, 0.7-0.8 cm. long, reflexed; anthers oblong-sagittate, 0.5 cm. long, minutely and densely puberulent

dorsally, the tips slightly exserted; ovary ovoid, about 0.125 cm. long, sparsely and minutely pilosulose; stigma subcapitate-maniculate, about 0.15 cm. long; nectaries fleshy, essentially separate, compressed-ovoid, slightly surpassing the ovary; follicles unknown.

PERU: LORETO: Balsapuerto, alt. about 220 m., forest, May, 1933, *Klug 3066* (MBG, TYPE).

This species is quite likely to be mistaken for *P. trifida* upon first sight. From that species, however, it differs in the looser inflorescence, longer pedicels, more delicate texture of the calyx-lobes, and more conspicuously exserted epistaminal appendages, in addition to the pubescent flowers and anthers as indicated in the key to species.

**32. *Prestonia plumierifolia* Mgf. Notizblatt 10: 1038. 1930.**

Stems relatively stout, minutely appressed-puberulent when young, glabrate and conspicuously lenticellate when fully mature; leaves obovate to obovate-lanceolate, apex obtuse or rounded, infrequently extremely abruptly and shortly acuminate to submucronate, base obtuse, cuneate, 8–16 cm. long, 3–6 cm. broad, subcoriaceous, opaque, or the upper surface slightly nitidulous, sparsely and minutely puberulent when very young, soon perfectly glabrate; petioles 0.5–1.5 cm. long, minutely and rather sparsely puberulent-papillate to glabrate; stipular appendages intrapetiolar, numerous, minutely and narrowly dentiform; inflorescence corymbose, dichotomous, bearing 8–30 greenish-yellow flowers; peduncle somewhat shorter than the subtending leaves; pedicels 0.4–1.0 cm. long, somewhat accrescent after maturity, minutely ferruginous-puberulent; bracts ovate-lanceolate, 0.1 cm. long or less, scarious; calyx-lobes oblong-elliptic, acute to acuminate, 0.6–0.8 cm. long, subcoriaceous, minutely and sparsely puberulent-papillate to glabrate, conspicuously suffused with purple, the internal squamellae deltoid-dentiform, minutely erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.2–1.5 cm. long, about 0.35 cm. in diameter at the base, epistaminal appendages barely exserted, 0.3 cm. long, faucal annulus conspicuously

thickened, the lobes obliquely obovate, shortly acuminate, 0.7–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exerted, narrowly sagittate, slightly pandurate, 0.5 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.1–0.15 cm. long; nectaries compressed-ovoid, concrescent at the base, somewhat shorter than the ovary; follicles unknown.

BRAZIL: in hortum paraëensem, introductu (prov. Rio Purus), Aug. 9, 1905, Huber 7030 (B, ISOTYPE, MBG, photograph and analytical drawings).

This species is founded upon a cultivated specimen said to have been introduced from the region of the Rio Purus, State of Amazonas, Brazil.

33. *Prestonia amazonica* (Benth.) Macbr. Field Mus. Publ. Bot. 11: 34. 1931.

*Haemadictyon Amazonicum* Benth. ex Muell.-Arg. in Mart.

Fl. Bras. 6<sup>1</sup>: 166. 1860; Miers, Apoc. So. Am. 262. 1878.

Stems relatively stout, minutely puberulent when young, becoming glabrate and conspicuously lenticellate when fully mature; leaves broadly oval, apex abruptly and shortly acuminate, base obtuse or rounded, 7–13 cm. long, 3–7 cm. broad, firmly membranaceous, opaque, minutely puberulent when young, glabrate when mature; petioles 0.8–1.1 cm. long, minutely puberulent to glabrate; stipular appendages intrapetiolar, numerous, minutely denticulate; inflorescence corymbose or subumbellate, simple or obscurely dichotomous, bearing 6–15 greenish-yellow flowers; peduncle somewhat shorter than the subtending leaves, minutely and sparsely puberulent to glabrate; pedicels 1.5–1.7 cm. long, somewhat accrescent after maturity, minutely puberulent-papillate; bracts minutely ovate-lanceolate, 0.1–0.3 cm. long, scarious; calyx-lobes ovate, acuminate, 0.5–0.6 cm. long, subcoriaceous, suffused with purple, minutely papillate without, the internal squamellae very deeply lacerate; corolla salverform, densely papillate without, the tube 1.3–1.4 cm. long, about 0.25 cm. in diameter at the base, epistaminal appendages exerted, 0.4 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate,

0.7–0.8 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exerted, oblong-sagittate, 0.45–0.5 cm. long, glabrous; ovary ovoid, about 0.1 cm. long, minutely papillate; stigma 0.125 cm. long; nectaries compressed-obovoid, concrescent at the base, about equalling the ovary; follicles unknown.

BRAZIL: PARA: ad ripas fl. Trombetas et lacus Quiriquiry, Dec., 1849, Spruce 239 (M, TYPE, V, MBG, photograph and analytical drawings).

**34. *Prestonia Lindleyana*** Woodson, in Gleason & A. C. Smith, Bull. Torrey Bot. Club **60**: 392. 1933.

*Haemadictyon calycinum* Lindl. ex Miers, Apoc. So. Am. 259. 1878, not Muell.-Arg.

Stems glabrous, relatively slender, not evidently lenticellate; leaves oblong- to obovate-elliptic, apex shortly acuminate, base obtuse to rounded, 10–16 cm. long, 3–7 cm. broad, firmly membranaceous to subcoriaceous, glabrous, pale green above, somewhat glaucescent beneath; petioles 0.3–0.8 cm. long, glabrous; stipular appendages numerous, interpetiolar, minutely and narrowly dentiform-flagelliform; inflorescence densely racemose, simple, bearing 10–20 yellowish flowers; peduncle somewhat shorter than the subtending leaves; pedicels 0.5–1.0 cm. long, minutely appressed-puberulent; bracts ovate or ovate-lanceolate, 0.1–0.2 cm. long, slightly foliaceous; calyx-lobes ovate to ovate-oblong, acute to acuminate, 0.9–1.0 cm. long, membranaceous, green, flushed with purple at the base, glabrous, the internal squamellae broadly deltoid-trigonal, entire or slightly erose-undulate; corolla salverform, glabrous or very minutely papillate without, the tube 0.9–1.5 cm. long, about 0.25 cm. in diameter at the base, epistaminal appendages exerted, 0.25 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.6–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exerted, oblong-sagittate, slightly pandurate, 0.4–0.45 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, densely and minutely papillate; stigma 0.125–0.15 cm. long; nectaries com-

pressed obovoid, separate or slightly concrescent, equalling or slightly surpassing the ovary; follicles unknown.

BRAZIL: AMAZONAS: prope Barra, Prov. Rio Negro, Oct., 1851, *Spruce 1882* (B, Bx, Camb., TYPE, V, MBG, photograph and analytical drawings); Municipality Humayta, near Livramento, on Rio Livramento, on varzea land, Oct. 12–Nov. 6, 1934, *Krukoff 6763* (NY); MATTO GROSSO: on varzea land near river-shore, near Tabajaa, upper Machado River region, Nov.–Dec., 1931, *Krukoff 1427* (MBG, NY).

**35. *Prestonia denticulata* (Vell.) Woodson, comb. nov.**

*Echites denticulata* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 30. 1827; A. DC. in DC. Prodr. 8: 455. 1844.

*Echites suberosa* Vell. Fl. Flum. 111. 1830; Icon. 3: pl. 34. 1827; A. DC. loc. cit. 475. 1844.

*Haemadictyon Gaudichaudii* A. DC. loc. cit. 426. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 168. 1860; Miers, Apoc. So. Am. 256. 1878.

*Haemadictyon denticulatum* (Vell.) Miers, loc. cit. 257. 1878.

*Haemadictyon ovatum* Miers, loc. cit. 258. 1878.

*Prestonia Gaudichaudii* (A. DC.) K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895.

Stems relatively slender, minutely appressed-puberulent when very young, becoming glabrate and rather inconspicuously lenticellate when fully mature; leaves oblong-elliptic to broadly oval, apex obtuse to shortly acuminate, base obtuse or rounded, 6–13 cm. long, 3–6 cm. broad, firmly membranaceous, opaque, puberulent when young, above glabrous, beneath minutely and rather sparsely papillate when fully mature; petioles 0.2–1.1 cm. long, minutely appressed-puberulent to glabrate; stipular appendages intrapetiolar, numerous, narrowly dentiform; inflorescence racemose, simple, bearing 12–30 yellow flowers; peduncle about equalling or somewhat shorter than the subtending leaves, sparsely appressed-puberulent to glabrate; pedicels 0.4–1.2 cm. long, densely and minutely puberulent; bracts minutely ovate-lanceolate, 0.1–0.3 cm. long, scarious; calyx-lobes broadly oblong- to ovate-elliptic, acute to shortly acuminate, 0.4–0.65 cm. long, subcoriaceous to rigidly membranaceous, more or less suffused with purple, minutely puberulent to puberulent-papillate, the internal squamellae



deltoid-ligular, entire or very minutely erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.1–1.3 cm. long, about 0.25–0.3 cm. in diameter at the base, epistaminal appendages somewhat exserted, 0.25–0.32 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.45–0.65 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exserted, sagittate, 0.4–0.55 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.1–0.125 cm. long; nectaries compressed-ovoid, irregularly conerescent at the base, equalling or slightly surpassing the ovary; follicles relatively long and slender, conspicuously moniliform, 20–39 cm. long, glabrous or very sparsely and minutely puberulent-papillate; seeds 1.2–1.3 cm. long, the pale yellowish coma 1.5–1.9 cm. long.

BRAZIL: RIO DE JANEIRO: in collibus umbrosis inter frutices, vic. Rio de Janeiro, 1835, *Gaudichaud 533* (B, DC, DL, MBG, photograph and analytical drawings); Rio de Janeiro, date lacking, *Glaziou 12954* (B); same data, *Glaziou 3728* (Bx); same data, 1872, *Glaziou 4881* (B); Barra do Pirahy, April 13, 1926, *Hochne & Gehrt 17319* (B); Morro de São João, Jan. 8, 1887, *Schenck 1947* (B); Serra da Bica, Febr., 1897, *Ule 4285* (B); in silvis prope Hortum Botanicum Rio de Janeiro, Febr. 13, 1916, *Constantino 7787* (B); DATA INCOMPLETE: *Sellow s.n.* (B); *Riedel s.n.* (B, BB, G, U, V); *Regel s.n.* (Camb.); *Forrest s.n.* (Camb.).

*P. denticulata* is one of the most uniform and distinctive species of the genus. Consequently Vellozo's epithets may be rather safely interpreted as pertaining to this species, particularly since they refer to plants of Rio de Janeiro, where *P. denticulata* is apparently frequent and endemic.

36. *Prestonia Meg'agros* (Vell.) Woodson, Ann. Mo. Bot. Gard. 21: 623. 1934.

*Echites Meg'agros* Vell. Fl. Flum. 110. 1830; Icon. 3: pl. 33. 1827.

*Haemadictyon asperum* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 169. 1860; Miers, Apoc. So. Am. 258. 1878.

*Haemadictyon megalagrion* Muell.-Arg. loc. cit. 170. 1860.

*Prestonia megalagrion* (Muell.-Arg.) Miers, loc. cit. 149. 1878.

† *Prestonia laeta* Miers, loc. cit. 1878.

Stems relatively stout, densely ferruginous-hirtellous to glabrate; leaves broadly oval to broadly obovate, apex obtuse or rounded, occasionally very shortly and abruptly acuminate-submucronate, 11–20 cm. long, 5–12 cm. broad, coriaceous or subcoriaceous, beneath opaque, densely ferruginous-puberulent to subtomentulose, above somewhat nitidulous, ferruginous-puberulent to glabrate; petioles 1.0–1.4 cm. long, ferruginous-hirtellous; stipular appendages intrapetiolear, numerous, minutely dentiform; inflorescence corymbose, di- or trichotomous, bearing 20–40 yellowish flowers; peduncle somewhat shorter than the subtending leaves, ferruginous-hirtellous; pedicels 0.6–1.2 cm. long, somewhat accrescent after maturity, minutely ferruginous-hirtellous; bracts narrowly lanceolate, 0.4–0.7 cm. long, scarious or somewhat petalaceous; calyx-lobes oblong-lanceolate, acuminate, 1.0–1.6 cm. long, minutely ferruginous-hirtellous without, subcoriaceous, deeply suffused with purple, the internal squamellae broadly deltoid, minutely emarginate or erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.3–1.4 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages slightly exserted, 0.3–0.35 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 1.0–1.2 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exserted, oblong-sagittate, slightly pandurate, 0.55 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, minutely papillate; stigma 0.15 cm. long; nectaries compressed-ovoid, more or less conerescent at the base, slightly shorter than the ovary; foli-  
cles unknown.

BRAZIL: PARA: Obidos, silva non inundata, July 23, 1927, *Ducke* 21602 (B, S); Obidos, silva secundaria, May 11, 1905, *Ducke* 21634 (B).

These specimens compare very well with Vellozo's illustration, particularly with regard to the peculiar indument.

**37. *Prestonia obovata* Standl.** Jour. Wash. Acad. Sci. 15: 459. 1925.

Stems relatively stout, glabrous, conspicuously lenticellate when fully mature; leaves obovate to obovate-oblong, apex ob-

tuse or rounded, occasionally abruptly and very shortly acuminate-submucronate, base obtuse, somewhat cuneate, 9–16 cm. long, 4–8 cm. broad, coriaceous or subcoriaceous, glabrous, above dark green and somewhat nitidulous, beneath paler and somewhat glaucescent; petioles 0.7–1.2 cm. long, glabrous, or very sparsely and minutely pilosulose; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence corymbose, dichotomous, bearing 10–30 purplish-yellow flowers; peduncle much shorter than the subtending leaves, glabrous; pedicels 1.1–1.5 cm. long, minutely and sparsely pilosulose to glabrate; bracts minutely ovate-lanceolate, 0.15–0.2 cm. long, scarious; calyx-lobes oblong-elliptic, acuminate, 1.0–1.2 cm. long, coriaceous, minutely papillate to glabrate without, purplish, the internal squamellae deltoid-dentiform, minutely erose; corolla salverform, minutely papillate without, 1.0–1.3 cm. long, about 0.35 cm. in diameter at the base, epistaminal appendages wholly included, 0.12–0.15 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers narrowly sagittate, slightly pandurate, 0.5–0.55 cm. long, glabrous, slightly exserted; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries concrescent, rather thick and fleshy, entire or slightly undulate, somewhat surpassing the ovary; follicles unknown.

PANAMA: CANAL ZONE: trail between Gamboa and Cruces, July 2, 1911, *Pittier 3767* (G, US, TYPE, MBG, photograph and analytical drawings); Barbour-Lathrop Trail, Barro Colorado Island, Oct. 12, 1931, *Shattuck 189* (MBG).

**38. *Prestonia concolor*** (S. F. Blake) Woodson, in Standl. & Record, Field Mus. Publ. Bot. **12**: 327. 1936.

*Belandra concolor* S. F. Blake, Contr. Gray Herb. **52**: 78. 1917.

Stems relatively slender, minutely and rather sparsely pilosulose when very young, glabrate and rather inconspicuously lenticellate when fully mature; leaves oblong-elliptic, apex shortly acuminate, base obtuse to rounded, 9–13 cm. long, 3–5 cm. broad, subcoriaceous, glabrous, pale green, above slightly

nitidulous, beneath opaque; petioles 0.6–0.9 cm. long, glabrous to minutely papillate; stipular appendages interpetiolar, numerous, very minutely dentiform-flagelliform; inflorescence racemose, simple, bearing 30–40 greenish-yellow (?) flowers; peduncle about equalling the subtending leaves, glabrous or minutely papillate; pedicels 0.7–1.0 cm. long, somewhat accrescent after maturity, minutely papillate; bracts linear-lanceolate, 0.05–0.07 cm. long, scarious; calyx-lobes ovate-elliptic, acute to acuminate, 0.4–0.5 cm. long, membranaceous or slightly subcoriaceous, deeply suffused with purple, minutely papillate without, the internal squamellae deltoid, minutely erose or lacerate; corolla salverform, glabrous or very minutely papillate without, the tube 1.5–1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages wholly included, 0.17–0.2 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.8–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exerted, narrowly oblong-sagittate, 0.48–0.5 cm. long, glabrous or very minutely puberulent-papillate; ovary ovoid, about 0.125 cm. long, glabrous; stigma 0.1 cm. long; nectaries conerescent, entire or slightly undulate, somewhat surpassing the ovary; follicles unknown.

BRITISH HONDURAS: low banks of Rio Grande, March 25, 1907, Peck 953 (G, TYPE, MBG, photograph and analytical drawings).

**39. *Prestonia versicolor* Woodson, spec. nov.**

Suffruticosa volubilis omnino glabra; ramulis crassiusculis maturitate conspicue lenticellatis; foliis ovalibus oblongo-ellipticisve apice abrupte breviterque acuminatis basi obtusis vel rotundatis 10–17 cm. longis 5–9 cm. latis rigide membranaceis opacis; petiolis 1.3–2.1 cm. longis; appendicibus stipulaceis interpetiolaribus multis minutissime denticularibus; inflorescentiis subcorymbosis dichotome divisis; pedunculo foliis multo brevior; pedicellis 1.4–1.6 cm. longis post maturitatem paulo accrescentibus glabris vel minutissime papillatis; bracteis minutissimis; calycis laciniis oblongo-ellipticis acutis acuminatisve 0.8–1.0 cm. longis membranaceis viridibus incon-

spicue purpurissatis squamellis denticulato-trigonalibus integris; corollae salverformis tubo 1.2–1.6 cm. longo basi ca. 0.3 cm. diametro metiente prope fauces paulo angustato appendicibus epistaminalibus omnino inclusis 0.15 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 0.7–0.9 cm. longis patentibus; antheris paulo exsertis oblongo-sagittatis paululo panduratis 0.6 cm. longis glabris; ovario ovoideo ca. 0.15 cm. longo glabro; stigmatе 0.15 cm. longo; nectariis concrescentibus margine leviter erosio tenibus haud incrassatis ovarium conspicue superantibus; folliculis ignotis.

Plants completely glabrous; stems relatively stout, conspicuously lenticellate when fully mature; leaves oval or oblong-elliptic, apex abruptly and shortly acuminate, base obtuse or rounded, 10–17 cm. long, 5–9 cm. broad, firmly membranaceous, opaque, petioles 1.3–2.1 cm. long; stipular appendages interpetiolar, numerous, very minutely dentiform; inflorescence subcorymbose, dichotomous; peduncle much shorter than the subtending leaves; pedicels 1.4–1.6 cm. long, somewhat accrescent after maturity, glabrous or very minutely papillate; bracts very minute, scarcely visible; calyx-lobes oblong-elliptic, acute to acuminate, 0.8–1.0 cm. long, membranaceous, green inconspicuously flushed with purple, the internal squamellae dentiform-trigonal, entire; corolla salverform, glabrous without, the tube 1.2–1.6 cm. long, about 0.3 cm. in diameter at the base, slightly constricting toward the orifice, epistaminal appendages wholly included, 0.15 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exserted, oblong-sagittate, slightly pandurate, 0.6 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries completely concrescent, thin and more or less diaphanous, not fleshy, slightly erose, conspicuously surpassing the ovary; follicles unknown.

PANAMA: COLON: Cana and vicinity, alt. 2000–6500 ft., April 17–June 8, 1908, E. S. Williams 940 (NY, TYPE, MBG, photograph and analytical drawings); Perme, April 23, 1933, Cooper 237 (NY).



The color of the flowers is reported by Williams as "Tube pink, divisions greenish outside, purple lines within."

**40. *Prestonia peregrina* Woodson, spec. nov.**

Suffruticosa volubilis; ramulis crassiusculis juventate minute appresse-puberulis maturitate minute irregulariterque scabridulis conspicue lenticellatis; foliis oblongo-ellipticis apice abrupte breviterque acuminatis basi obtusis 8-17 cm. longis 3-7 cm. latis rigide membranaceis opacis omnino glabris; petiolis 0.9-2.0 cm. longis minute sparseque puberulo-papillatis; appendicibus stipulaceis interpetiolaribus multis minute denticulo-flagelliformibus; inflorescentiis subcorymbosis dichotome subdivisis flores 30-60 albo-luteos gerentibus; pedunculo folia superante glabro vel indistincte irregulariterque puberulo-papillato; pedicellis 0.7-1.5 cm. longis post maturitatemve paulo accrescentibus minute papillatis; bracteis ovato-lanceolatis 0.1-0.15 cm. longis scariaceis; calycis laciniis oblongo-ellipticis acuminatis 1.1-1.5 cm. longis subcoriaceis saturate purpurissatis extus glabris squamellis deltoideis minute erosis; corollae salverformis extus glabrae vel minutissime papillatae tubo 1.6-1.8 cm. longo basi ca. 0.3 cm. diametro metiente appendicibus epistaminalibus omnino inclusis ca. 0.1 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 0.7-0.9 cm. longis patentibus; antheris paulo exsertis oblongo-sagittatis paululo panduratis 0.5-0.6 cm. longis glabris vel minutissime papillatis; ovario ovoideo ca. 0.15 cm. longo glabro; stigmatibus 0.125-0.15 cm. longo; necariis conerescentibus tenuibus haud incrassatis margine minute erosis ovarium conspicue superantibus; folliculis gracilimis continuis leviter falcatis apice saepius connatis 36-38 cm. longis glabris; seminibus ignotis.

Stems relatively stout, minutely appressed-puberulent when young, minutely and irregularly scabridulous and conspicuously lenticellate when fully mature; leaves oblong-elliptic, apex abruptly and shortly acuminate, base obtuse, 8-17 cm. long, 3-7 cm. broad, firmly membranaceous, opaque, glabrous; petioles 0.9-2.0 cm. long, minutely and sparsely puberulent-papillate; stipular appendages interpetiolar, numerous, mi-

minutely dentiform-flagelliform; inflorescence subcorymbose, dichotomously subdivided, bearing 30–60 yellowish flowers; peduncle somewhat surpassing the subtending leaves, glabrous or indistinctly and irregularly puberulent-papillate; pedicels 0.7–1.5 cm. long, or somewhat accrescent after maturity, minutely papillate; bracts ovate-lanceolate, 0.1–0.15 cm. long, scariaceous; calyx-lobes oblong-elliptic, acuminate, 1.1–1.5 cm. long, subcoriaceous, deeply suffused with purple, glabrous, the internal squamellae deltoid, minutely erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.6–1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages wholly included, about 0.1 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.7–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers slightly exerted, oblong-sagittate, slightly pandurate, 0.5–0.6 cm. long, glabrous or very minutely papillate; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.125–0.15 cm. long; nectaries wholly conerescent, thin and somewhat diaphanous, not fleshy, minutely erose, conspicuously surpassing the ovary; follicles relatively slender, continuous, somewhat falcate, the tips frequently connate, 36–38 cm. long, glabrous; seeds unknown.

ECUADOR: GUAYAS: Balao, March, 1892, *Eggers 14527* (M); PICHINCHA: Tandapi, ad marg. silvulae, July, 1920, *Heßborn 771* (DL, G, S, TYPE, MBG, photograph and analytical drawings).

The affinities of this species accentuate still further the intimate relationship of certain elements of the flora of Ecuador for the flora of Central America.

**41. *Prestonia vallis* Woodson, spec. nov.**

Fruticosa vel suffruticosa volubilis; ramulis gracilibus glaberrimis maturitate conspicue lenticellatis; foliis ovalibus apice breviter acuminatis basi late obtusis 10–14 cm. longis 4.5–6.5 cm. latis membranaceis glaberrimis utrinque opacis; petiolis 0.6–0.8 cm. longis glabris; appendicibus stipulaceis intrapetiolaribus minute pectinatis numerosis; inflorescentiis corymbosis dichotomis flores 20–25 speciosos brunneos gerenti-

bus; pedunculo petiolos bis terve superante minutissime puberulo haud ferrugineo; pedicellis 1.0–1.2 cm. longis minutissime puberulo-papillatis; bracteis ovato-lanceolatis 0.15–0.25 cm. longis scariaceis; calycis laciniis ovato-lanceolatis acute acuminatis 1.3–1.4 cm. longis firmiter membranaceis foliaceis vel paululo purpurissatis glaberrimis squamellis deltoideis minute irregulariterque erosis; corollae salverformis tubo 1.4–1.5 cm. longo basi ca. 0.18–0.2 cm. diametro metiente extus glabro intus prope insertionem staminum molliter puberulo appendicibus epistaminalibus oblongis 0.1–0.125 cm. longis profunde inclusis annulo faucium conspicue incrassato lobis oblique obovatis 1.5–1.7 cm. longis patentibus; antheris lanceolato-sagittatis 0.6 cm. longis dorso minute puberulis apice paulo exsertis; ovario ovoideo 0.1 cm. longo apice inconspicuissime barbellato; stigmatibus subcapitato-maniculato ca. 0.15 cm. longo; nectariis basi concrecentibus ubique paululo incrassatis caeterumque delicate membranaceis plus minusve foliaceis minute pilosulis ovarium ca. dimidio superantibus; folliculis ignotis.

Stems relatively slender, glabrous, conspicuously lenticellate when fully mature; leaves oval, apex shortly acuminate, base broadly obtuse, 10–14 cm. long, 4.5–6.5 cm. broad, membranaceous, glabrous, opaque throughout; petioles 0.6–0.8 cm. long, glabrous; stipular appendages intrapetiolar, minutely pectinate, numerous; inflorescence corymbose, dichotomous, bearing 20–25 showy brownish flowers; peduncle about twice to thrice surpassing the subtending petioles, minutely, but not ferruginously, puberulent; pedicels 1.0–1.2 cm. long, minutely puberulent-papillate; bracts ovate-lanceolate, 0.15–0.25 cm. long, scarious; calyx-lobes ovate-lanceolate, acutely acuminate, 1.3–1.4 cm. long, firmly membranaceous, foliaceous or very slightly suffused with purple, glabrous, the squamellae deltoid, minutely and irregularly erose; corolla salverform, the tube 1.4–1.5 cm. long, about 0.18–0.2 cm. in diameter at the base, glabrous without, softly pubescent within near the insertion of the stamens, epistaminal appendages oblong, 0.1–0.125 cm. long, deeply included, faucal annulus conspicuously thickened, the lobes obliquely obovate, 1.5–1.7 cm. long, reflexed;

anthers lanceolate-sagittate, 0.6 cm. long, minutely puberulent dorsally, the tips slightly exserted; ovary ovoid, about 0.1 cm. long, the tips very inconspicuously barbellate, otherwise glabrous; stigma subcapitate-maniculate, about 0.15 cm. long; nectaries somewhat surpassing the ovary, conerescent and somewhat incrassate at the base, otherwise membranaceous and more or less foliaceous, entire or essentially so save for the five component divisions, minutely and sparsely pilosulose; follicles unknown.

COLOMBIA: VALLE DEL CAUCA: Urwald, Candelaria, alt. 2200 m., Jan. 1, 1931, *Dryander 1042* (B, TYPE, MBG, photograph and analytical drawings).

The foliaceous, puberulent nectary is the striking feature of this species, the membranaceous texture of which allies it to the species of § *Annulares* indigenous to Central America.

**42. *Prestonia Schippii* Woodson, spec. nov.**

Suffruticosa volubilis; ramulis gracilibus juventate minute puberulo-papillatis mox glabratis maturitate conspicue sed minute lenticellatis; foliis oblongo-ellipticis apice abrupte breviterque acuminatis basi obtusis rotundatisve 10–17 cm. longis 4–7 cm. latis rigidiuscule membranaceis opacis glabris; petiolis 1.2–1.6 cm. longis glabris rariusve minutissime papillatis; appendicibus stipulaceis intrapetiolaribus multis minutissime denticulato-flagelliformibus; inflorescentiis subcorymbosis simplicibus flores 10–12 gilvos gerentibus; pedunculo foliis multo brevioribus glabris; pedicellis 1.2–1.5 cm. longis post maturitatem paulo accrescentibus glabris vel minutissime papillatis; bracteis ovato-lanceolatis 0.1–0.2 cm. longis scariaceis vel rarius majoribus subfoliaceis; calycis laciniis obovato-ellipticis acutis 1.0–1.2 cm. longis glabris subcoriaceis paululo purpurissatis squamellis denticulato-trigonalibus integris; corollae salverformis extus minute papillatae tubo 1.3–1.4 cm. longo basi ca. 0.3 cm. diametro metiente appendicibus epistaminalibus omnino inclusis ca. 0.3 cm. longis annulo faucium conspicue incrassato lobis oblique obovatis breviter acuminatis 0.9–1.0 cm. longis patentibus; antheris paulo exsertis oblongo-sagittatis 0.5 cm. longis dorso minute hirtellis; ovario ovoideo

ca. 0.15 cm. longo glabro; stigmat 0.125 cm. longo; nectariis concrescentibus tenuibus haud incrassatis margine erosis ovarium conspicue superantibus; folliculis ignotis.

Stems relatively slender, minutely puberulent-papillate when young, soon becoming glabrate and conspicuously but minutely lenticellate when fully mature; leaves oblong-elliptic, apex abruptly and shortly acuminate, base obtuse or rounded, 10–17 cm. long, 4–7 cm. broad, firmly membranaceous, opaque, glabrous; petioles 1.2–1.6 cm. long, glabrous or minutely papillate; stipular appendages intrapetiolar, numerous, very minutely dentiform-flagelliform; inflorescence subcorymbose, simple, bearing 10–12 cream-colored flowers; peduncle much shorter than the subtending leaves, glabrous; pedicels 1.2–1.5 cm. long, somewhat accrescent after maturity, glabrous or very minutely papillate; bracts ovate-lanceolate, 0.1–0.2 cm. long, scariaceous, or rarely the lowermost somewhat larger and subfoliaceous; calyx-lobes narrowly obovate-elliptic, acute, 1.0–1.2 cm. long, glabrous, subcoriaceous, slightly purple-tinted, the internal squamellae denticulate-trigonal, entire; corolla salverform, minutely papillate without, the tube 1.3–1.4 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages wholly included, about 0.3 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.9–1.0 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers oblong-sagittate, slightly pandurate, 0.5 cm. long, dorsally minutely hirtellous, slightly exserted; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.125 cm. long; nectaries wholly concrescent, thin and somewhat diaphanous, not fleshy, slightly erose, conspicuously surpassing the ovary; follicles unknown.

BRITISH HONDURAS: rare, climbing over low trees in forest, Eldorado, alt. 200 ft., Sept. 22, year lacking, *Schipp 8-388* (FM, TYPE, MBG, photograph and analytical drawings).

The affinities of this species are outlined in the key to species. It is the second species of § *Annulares* to be reported from British Honduras, apparently the northernmost range of the section.



**43. *Prestonia guatemalensis* Woodson, spec. nov.**

Fruticosa volubilis; ramulis sat crassiusculis teretibus glabris maturitate conspicue lenticellato-verrucosis; foliis breviter petiolatis late obovato-ellipticis apice breviter acutaeque acuminatis basi obtuse cuneatis 18–25 cm. longis 8–10 cm. latis firme membranaceis glaberrimis; petiolis 1.0–1.5 cm. longis; appendicibus stipulaceis interpetiolaribus anguste dentiformibus multis; inflorescentiis lateralibus bis terve dichotome divisus plurifloris; pedunculo post maturitatem 5.5–6.0 cm. longo glabro lenticellato-verrucoso; pedicellis 0.9–1.2 cm. longis minute papillatis (?); calycis laciniis latiuscule ellipticis obtusiusculis vel late acutis 0.7–0.9 cm. longis subcoriaceis dilute viridibus ut creditur haud purpurissatis extus intusque minute papillatis squamellis sat parvis acuminatis; corollae salverformis ut creditur luteae tubo 1.8–2.0 cm. longo basi ca. 0.2–0.225 cm. diametro metiente extus glabro intus prope insertionem staminum minute puberulo caeterumque glabriusculo appendicibus linearibus integris valde exsertis faucibus conspicue calloso-incrassatis lobis oblique obovatis minute acuminatis 1.2–1.3 cm. longis extus minutissime papillatis intus glabriusculis; antheris valde exsertis 0.6 cm. longis glabris; ovario ovoideo ca. 0.1 cm. longo glabriusculo; stigmatibus 0.15 cm. longo; nectariis conerescentibus membranaceis margine anguste lobatis ca. 0.15 cm. longis ovarium omnino superantibus; folliculis teretibus falcatis 30–50 cm. longis ca. 0.4–0.5 cm. diametro metientibus apice saepe conerescentibus glabris; seminibus 1.5–1.8 cm. longis como dilute luteo ca. 2.5 cm. longo.

Fruticose lianas; stems rather stout, terete, glabrous, warty-lenticellate when fully mature; leaves shortly petiolate, broadly obovate-elliptic, apex shortly and acutely acuminate, base obtusely cuneate, 18–25 cm. long, 8–10 cm. broad, firmly membranaceous, glabrous throughout; petioles 1.0–1.5 cm. long; stipular appendages interpetiolar, numerous, narrowly dentiform; inflorescence lateral, twice- to thrice-dichotomous, bearing several yellowish flowers; peduncle (somewhat after maturity) 5.5–6.0 cm. long, glabrous, warty-lenticellate; pedicels 0.9–1.2 cm. long, minutely papillate (?); calyx-lobes rather

broadly elliptic, obtusish to rather broadly acute, 0.7–0.9 cm. long, subcoriaceous, pale green, evidently not suffused with purple, minutely papillate without and within, the squamellae relatively small, acuminate; corolla salverform, the tube 1.8–2.0 cm. long, about 0.2–0.225 cm. in diameter at the base, glabrous without, minutely puberulent within near the attachment of the stamens, otherwise glabrous, the internal appendages linear, entire, somewhat exserted, the orifice callose-annulate, the lobes obliquely obovate, minutely acuminate, 1.2–1.3 cm. long, very minutely papillate without, essentially glabrous within; anthers exserted, 0.6 cm. long, glabrous; ovary ovoid, about 0.1 cm. long, essentially glabrous; stigma 0.15 cm. long; nectaries concrescent, membranaceous, the margin narrowly and minutely lobed, about 0.15 cm. long, completely concealing the ovary; follicles terete, falcate, usually united at the tips, 30–50 cm. long, about 0.4–0.5 cm. in diameter, glabrous; seeds 1.5–1.8 cm. long, the pale yellow coma about 2.5 cm. long.

GUATEMALA: Sepacuite, Oct., 1901, *Owen 1* (US, TYPE, MBG, photograph);

SANTA ROSA: Volcan Tecuamburro, alt. 2000 m., Febr., 1893, *Heyde & Lux 4539* (G).

Closely related to *P. portobellensis*, differing chiefly in the calyx-lobes, squamellae, and more extensive inflorescence. *Heyde & Lux 4539* is unfortunately long past prime and rather fragmentary; its relegation to this species is therefore somewhat uncertain.

**44. *Prestonia portobellensis*** (Beurl.) Woodson, Ann. Mo. Bot. Gard. 18: 553. 1931.

*Echites portobellensis* Beurl. Vet. Akad. Handl. Stockh. 137. 1854 (1856).

*Haemadictyon schizadenium* Muell.-Arg. Linnaea 30: 431. 1860; Miers, Apoc. So. Am. 261. 1878.

*Prestonia schizadenia* (Muell.-Arg.) Hemsl. Biol. Centr.-Am. Bot. 2: 312. 1881.

*Prestonia* (*Haemadictyon*) *macrocarpa* Hemsl. loc. cit. 311. 1881.

Stems relatively stout, minutely scabridulous in the vicinity of the nodes, conspicuously lenticellate when fully mature; leaves oblong-elliptic, apex obtuse to abruptly and shortly acu-

minate, base obtuse or rounded, 9–29 cm. long, 3–18 cm. broad, firmly membranaceous to subcoriaceous, glabrous, opaque, or slightly nitidulous above; petioles 0.6–3.0 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence subcorymbose, di- or trichotomous, less frequently simple, bearing 8–30 purplish-yellow flowers; peduncle much shorter than the subtending leaves, glabrous; pedicels 0.6–1.8 cm. long, somewhat accrescent after maturity, glabrous or very minutely papillate; bracts ovate-lanceolate, 0.05–0.4 cm. long, scarious or slightly foliaceous; calyx-lobes oblong-elliptic, acuminate, 1.1–1.7 cm. long, coriaceous or subcoriaceous, more or less flushed with purplish, glabrous or very minutely and indistinctly papillate, the squamellae dentiform-deltoid, very minutely erose; corolla salverform, glabrous or very minutely papillate without, the tube 1.1–1.7 cm. long, about 0.3–0.35 cm. in diameter at the base, epistaminal appendages slightly exerted or at least attaining the faucal annulus, 0.2–0.4 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 1.0–1.5 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers slightly exerted, narrowly oblong-sagittate, slightly pandurate, 0.5–0.6 cm. long, puberulent-papillate to minutely papillate dorsally; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.15 cm. long; nectaries wholly concrescent, thin and somewhat diaphanous, not thick and fleshy, minutely erose or lacerate, conspicuously surpassing the ovary; follicles relatively long and stout, 33–35 cm. long, continuous, somewhat falcate, often united at the tips, glabrous; seeds 1.5–1.6 cm. long, the pale yellowish coma 2.5–3.7 cm. long.

MEXICO: OAXACA: vicinity of Cafetal Concordia, alt. 400–650 m., April 1–15, 1933, *Morton & Makrinus 2348* (US).

HONDURAS: ATLANTIDA: beside the trail, above Lancetilla, alt. 200 ft., July 15, 1934, *Yuncker 4596* (Herb. Univ. Mich.).

SALVADOR: SONSONATE: vicinity of Sonsonate, alt. 220–300 m., March 18–27, 1922, *Standley 22349* (G).

COSTA RICA: LIMON: Moin Hill, près Limon, June, 1898, *Pittier 12401* (G, V); Pinta près Limon, litt. Atlantique, Sept., 1899, *Pittier 16016* (E, G); PUNTARENAS: forêts de Santo Domingo de Golfo Dulce, March, 1896, *Pittier 9935* (BB, Bx); environs de Sto. Domingo de Osa, March, 1896, *Tondus 9889* (Bx, V).

PANAMA: COLON: Portobello, in silvis ad littora, April, 1826, *Billberg s.n.* (S, TYPE, MBG, photograph and analytical drawings); Santa Rita trail, Febr. 27, 1905, *Cowell 105* (NY); Chagres, Jan.-March, 1850, *Fendler 250* (MBG, V); Gatun Sta., Jan. 28, 1860, *Hayes 450* (NY).

Remarks on this species and its nomenclature will be found in *Ann. Mo. Bot. Gard.* 18: 553-554. 1931. The species is not a very uniform nor constant one as interpreted above, and may require segregation at a future date.

**45. *Prestonia lacerata* Woodson, spec. nov.**

Fruticosa volubilis altitudine ignota; ramulis gracilibus glaberrimis maturitate conspicue lenticellatis; foliis oblongo-ellipticis apice abrupte acuminato-mucronatis basi late obtusis 12-20 cm. longis 5.5-9.5 cm. latis firmiter membranaceis subcoriaceisve glaberrimis supra sublutescentibus subtus opacis; petiolis 1.0-1.5 cm. longis; appendicibus stipulaceis interpetiolaribus numerosis minute dentiformibus vix bene visis; inflorescentiis corymbosis dichotome divisis flores gilvos 30-40 gerentibus; pedunculo foliis ca. dimidio brevioribus minutissime puberulis; pedicellis 1.2-1.3 cm. longis post maturitatem paulo accrescentibus minute ferrugineo-puberulis; bracteis acuminato-deltoides scariaceis vix 0.1 cm. longis; calycis laciniis oblongo-lanceolatis acute acuminatis 1.0-1.1 cm. longis membranaceis foliaceis post exsiccationem paulo purpuris-satis sparse minuteque pilosulis glabratissive squamellis subtrigonalibus acutis integris; corollae salverformis tubo 1.5 cm. longo basi ca. 0.18-0.2 cm. diametro metiente extus sparse minuteque puberulo-papillato intus prope insertionem staminum molliter puberulo appendicibus epistaminibus linearibus ca. 0.35 cm. longis paulo exsertis annulo faucium conspicue incrassato lobis oblique obovato-dolabriformibus 0.9 cm. longis patentibus; antheris oblongo-sagittatis 0.5 cm. longis dorso minute puberulis apice exsertis; ovario ovoideo ca. 0.15 cm. longo glabro; stigmate subcapitato-fusiforme 0.15 cm. longo; nectariis basi concrescentibus ubique aliquid incrassatis caeterumque delicate membranaceis purpuris-satisque hyalinis margine profunde irregulariterque laceratis ovarium ca. dimidio superantibus; folliculis gracilibus continuis falcatis 30-45 cm.

longis glaberrimis; seminibus immaturis 1.8–2.0 cm. longis como dilute aurantiaco ca. 4 cm. aequante.

Stems relatively slender, glabrous, conspicuously lenticellate at maturity; leaves oblong-elliptic, apex abruptly acuminate-mucronate, base broadly obtuse, 12–20 cm. long, 5.5–9.5 cm. broad, firmly membranaceous to subcoriaceous, glabrous, somewhat lustrous above, opaque beneath; petioles 1.0–1.5 cm. long; stipular appendages interpetiolar, numerous, minutely dentiform; inflorescence corymbose, dichotomously divided, bearing 30–40 pale yellowish flowers; peduncle about half as long as the subtending leaves, very minutely ferruginous-puberulent; pedicels 1.2–1.2 cm. long, somewhat accrescent at maturity, minutely ferruginous-puberulent; bracts acuminate-deltoid, scarious, less than 0.1 cm. long; calyx-lobes oblong-lanceolate, acutely acuminate, 1.0–1.1 cm. long, membranaceous, foliaceous (somewhat suffused with purple in desiccation), sparsely and minutely pilosulose to glabrate without, the squamellae subtrigonal, acute, entire; corolla salverform, the tube 1.5 cm. long, about 0.18–0.2 cm. in diameter at the base, sparsely and minutely puberulent-papillate without, softly puberulent near the insertion of the stamens within, epistaminal appendages linear, about 0.35 cm. long, slightly exserted, faucal annulus conspicuously thickened, the lobes obliquely obovate-dolabriform, 0.9 cm. long, reflexed; anthers oblong-sagittate, 0.5 cm. long, minutely puberulent dorsally, the tips slightly exserted; ovary ovoid, about 0.15 cm. long, glabrous; stigma subcapitate-fusiform, 0.15 cm. long; nectaries about twice surpassing the ovary, conrescent and somewhat incrassate at the base, membranaceous and purplish-hyaline above, deeply and irregularly lacerate; follicles slender, continuous, falcate, 30–45 cm. long, glabrous; seeds (immature) 1.8–2.0 cm. long, the pale tawny coma about 4 cm. long.

PERU: LORETO: Regenwald, Iquitos, alt. 100 m., May 12, 1925, *Tessmann 5106* (B, TYPE, MBG, photograph and analytical drawings).

Unique among the South American *Prestonias* because of the subpetalaceous nectary of the flowers, by which it simulates the Central American species of § *Annulares*.



Sect. 4. TOMENTOSAE Woodson. Relatively stout, usually densely ferruginous-pubescent lianas; leaves membranaceous to subcoriaceous; inflorescence simple or variously compound, typically bostrychoid-racemose to subumbellate; calyx-lobes relatively large and conspicuously foliaceous; corolla salverform, rarely infundibuliform, more or less densely pubescent without, appendiculate or exappendiculate within, the epistaminal appendages occasionally replaced by callous ridges, the faucal annulus conspicuously thickened or tuberculate; anthers included or the tips more or less exserted. Spp. 46-60.

This is the most difficult section of *Prestonia*. Since the delimitation of the species appears rather vague and confusing in certain instances, in spite of the relatively large number of herbarium specimens available for study, an endeavor has been made to maintain conservatively the specific limits recognized by previous botanists. Subsequent study, particularly if supplemented by extensive field observation, may well differ in this regard. It is scarcely to be avoided that our present conceptions of taxonomic units in the Apocynaceae, as in other tropical American groups, should be other than purely elemental.

In several instances in the delimitation of the species to follow, the color of the indument has appeared significant. Here the difficulty of ascribing intelligibly the color to desiccated specimens has been considerable, and doubtless will be found unsatisfactorily anticipated in many instances. It should be borne in mind that the color of the indument, described as such, refers in all instances to the collective color of the trichomes themselves, and not, for instance, to the gross shade of the indument viewed in conjunction with a variable background of leaf- or stem-surface, which would necessarily vary greatly according to the relative density of the trichomes and the consequently varying proportion of the vegetative ground tissue visible.

#### KEY TO THE SPECIES

A. Corolla-tube appendiculate within.

B. Epistaminal appendages exserted, or at least attaining the faucal annulus.

- C. Inflorescence dichotomous, occasionally rather obscurely so; foliar indument very finely velutinous, umber-brown, opaque.....46. *P. surinamensis*
- CC. Inflorescence simple, or rarely very obscurely compound.
- D. Calyx-lobes as long as the corolla-tube, or nearly so; inflorescence many-flowered.
- E. Anthers glabrous.
- F. Foliar indument dull yellowish- or buffy-brown, opaque, or scarcely lustrous; calyx tomentulose, subappressed; plants of northern Colombia to south-central Brazil and Paraguay.....47. *P. tomentosa*
- FF. Foliar indument dark orange-brown, lustrous; calyx hispid-hirsute to -hirsutulose.
- G. Foliar indument velutinous; calyx hispid-hirsutulose; plants of southeast-central Brazil.....48. *P. bahiensis*
- GG. Foliar indument hispid to hispidulose, much sparser than in the preceding; calyx hispid-hirsute; plants of Panama to French Guiana.....49. *P. ipomaeifolia*
- EE. Anthers pubescent, at least puberulent-papillate dorsally.
- F. Corolla-tube 1.6–2.0 cm. long, appressed-villosulose without, the lobes 1.2–1.5 cm. long; nectaries surpassing the ovary; plants of southern Brazil and adjacent Paraguay.....50. *P. calycina*
- FF. Corolla-tube 2.0–2.2 cm. long, minutely puberulent without, the lobes 2.0–2.2 cm. long; nectaries about half equalling the ovary; plants of Peru.....51. *P. cordifolia*
- DD. Calyx-lobes about half as long as the corolla-tube; inflorescence few-flowered.....52. *P. brachypoda*
- BB. Epistaminal appendages deeply included.
- C. Inflorescence simple, or essentially so, subumbellate; corolla 2.0–2.3 cm. long; anthers barely included.....53. *P. mucronata*
- CC. Inflorescence repeatedly dichotomous, corymbose or thyrsiform; corolla 1.0–1.3 cm. long; anther-tips exserted.....54. *P. parviflora*
- AA. Corolla-tube exappendiculate within, or with callous ridges or protuberances in the position of epistaminal appendages.
- B. Follicles very short and stout, napiform, sharply divaricated; species of Mexico and Central America.
- C. Corolla salverform, the tube not dilating above the insertion of the stamens, or scarcely so.
- D. Nectary annular, broadly 5-lobed, or essentially entire, about equaling or barely surpassing the ovary.
- E. Corolla 3.5–4.0 cm. long; epistaminal protuberances linear, 0.2–0.25 cm. long; plants of southern Mexico and Guatemala....55. *P. mexicana*
- EE. Corolla 2.8–3.0 cm. long; epistaminal protuberances nearly quadrate, 0.1–0.15 cm. long; plants of British Honduras.....56. *P. amanuensis*
- DD. Nectary tubular or subtubular, deeply 5-lobed, conspicuously surpassing the ovary; corolla 4.0–4.5 cm. long; plants of Costa Rica.....57. *P. isthmica*

- CC. Corolla infundibuliform, the tube conspicuously dilated above the insertion of the stamens.....58. *P. speciosa*
- BB. Follicles relatively long and slender, not divaricate; species of South America.
- C. Inflorescence relatively lax and elongate; anthers included, sparsely pilose.....59. *P. Riedelii*
- CC. Inflorescence congested, subumbellate; anther-tips exerted, glabrous.....60. *P. Schumanniana*

**46. *Prestonia surinamensis* Muell.-Arg. Linnaea 30: 433. 1860; Miers, Apoc. So. Am. 147. 1878.**

Stems relatively stout, densely and minutely ferruginous-tomentose, eventually becoming glabrate; leaves broadly ovate to ovate-elliptic, apex shortly and abruptly acuminate, base obtuse to rounded, 10-24 cm. long, 6-17 cm. broad, firmly membranaceous, uniformly and very densely velutinous when young, densely and very finely velutinous beneath, above minutely scabridulous to glabrate generally, pilosulose along the midrib and veins when fully mature, the indument dull umber-brown, opaque, not lustrous; petioles 0.7-3.5 cm. long, densely ferruginous-pubescent; stipular appendages interpetiolar, numerous, pectinate-flagelliform, more or less ferruginous-pilosulose; inflorescence corymbose, dichotomous, occasionally rather obscurely so, bearing 10-40 whitish-yellow flowers; peduncle minutely ferruginous-velutinous, much shorter than the subtending leaves; pedicels 0.4-0.7 cm. long, somewhat accrescent after maturity, minutely ferruginous-velutinous; bracts ovate-lanceolate, somewhat foliaceous, 0.6-0.8 cm. long; calyx-lobes broadly ovate- to oblong-elliptic, shortly acuminate to acute, 0.8-1.2 cm. long, foliaceous, minutely appressed ferruginous-velutinous, the internal squamellae broadly dentiform-ligular, emarginate, somewhat pilosulose; corolla salverform, densely ferruginous-villosulose without, the tube 1.5-1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages slightly exerted or at least attaining the orifice, 0.2-0.4 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.6-0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers barely exerted, oblong-sagit-

tate, 0.6–0.7 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous or essentially so; stigma 0.1–0.15 cm. long; nectaries concrescent, rather irregularly 5-cleft or essentially entire, fleshy, conspicuously surpassing the ovary; follicles very stout and rigid, narrowly napiform, sharply divaricate, 9–11 cm. long, minutely ferruginous-velutinous to glabrate; seeds 1.4–1.7 cm. long, the pale tawny coma 2.0–3.2 cm. long.

BRITISH GUIANA: upper Rupununi River, near Dadanawa, May 30, 1922, *Crus* 1419 (MBG, NY); same locality, June 10, 1922, *Crus* 1489 (MBG, NY).

DUTCH GUIANA: Plantatio Beekhuizen, date lacking, *Wulfschlägel* 1029 (Bx, V); exact locality and date lacking, *Hostmann* 981 (B, U, V, TYPE, MBG, photograph and analytical drawings); fluv. Tapanahoni, Aug., 1904, *Versteeg* 753 (U); fluv. Gonimi, Aug., 1903, *Versteeg* 72 (U).

BRAZIL: PARA: insula Mexiana, in fauce Amazonum fluvii, Sept. 20, 1901, *Guedes* 21640 (B); Rio Branco de Obidos, ad ripas fluminis, Jan. 28, 1918, *Ducke* 21628 (B); Ourem, Rio Guaura, Dec. 4, 1903, *Siqueira* 21633 (B).

47. *Prestonia tomentosa* R. Br. Mem. Wern. Soc. 1: 70. 1811; A. DC. in DC. Prodr. 8: 429. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 163. 1860; Miers, Apoc. So. Am. 144. *pl.* 20B. 1878.

*Prestonia latifolia* Benth. in Hook. Jour. Bot. 3: 250. 1841; A. DC. loc. cit. 429. 1844; Miers, loc. cit. 145. 1878.

*Prestonia lutescens* Muell.-Arg. loc. cit. 164. 1860; Miers, loc. cit. 147. 1878.

*Prestonia lanata* Muell.-Arg. loc. cit. 1860; Miers, loc. cit. 1878.

*Prestonia Cearensis* Miers, loc. cit. 148. 1878.

*Prestonia sericocalyx* Malme, Bihang till K. Sv. Vet. Akad. Handl. Afd. III. 24<sup>10</sup>: 29. 1899.

Stems relatively stout, densely and rather pale ferruginous-tomentose, eventually becoming glabrate; leaves broadly ovate, apex shortly acuminate, base broadly obtuse to rounded, infrequently very obscurely cordate, 8–19 cm. long, 5–12 cm. broad, firmly membranaceous, above rather sparsely and minutely ferruginous-hirtellous, more densely so along the midrib and veins, beneath densely and rather closely velutinous-tomentose, the indument dull yellowish- or buffy-brown, opaque, not lustrous; petioles 0.3–1.2 cm. long, minutely ferruginous-tomentose as upon the stem; stipular appendages interpetiolar,

pectinate-flagelliform, somewhat ferruginous-pilosulose at the base; inflorescence subumbellate, simple, bearing 10–30 waxy, yellow flowers; peduncle much shorter than the subtending leaves, pale ferruginous-tomentulose; pedicels 0.4–1.0 cm. long, somewhat accrescent after maturity, minutely ferruginous-tomentulose as upon the peduncle; bracts ovate-lanceolate, 0.8–1.8 cm. long, slightly foliaceous; calyx-lobes oblong- to ovate-elliptic, acute to acuminate, 1.0–1.8 cm. long, foliaceous, subappressed-tomentulose, the internal squamellae broadly dentiform, entire or very minutely erose; corolla salverform, densely and appressed ferruginous-villous without, the tube 1.5–1.8 cm. long, about 0.3–0.35 cm. in diameter at the base, epistaminal appendages barely exserted, or about attaining the orifice, 0.15–0.4 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 0.7–1.2 cm. long, reflexed or widely spreading; stamens inserted at about midway or the upper  $\frac{1}{3}$  of the corolla-tube, the anthers barely exserted, sagittate, 0.5–0.6 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, minutely puberulent-papillate; stigma 0.05–0.1 cm. long; nectaries concrescent, broadly and rather shallowly 5-lobed, fleshy, conspicuously surpassing the ovary; follicles stout and rigid, narrowly napiform, sharply divaricate, 6–9 cm. long, densely ferruginous-hispid; seeds 0.8–0.9 cm. long, the pale tawny coma 3.5–4.2 cm. long.

COLOMBIA: MAGDALENA: growing over a shrub on open, low grassland by a forest-lined stream, near Jordan, alt. 800 ft., Nov. 5, 1898, *H. H. Smith 165* (NY).

VENEZUELA: MERIDA: a few miles s. of Guigue, alt. 2000 ft., Jan. 25, 1855, *Fendler 1052* (G); Mariara, alt. 450 m., Sept., 1899, *Preuss 1617* (B).

BRITISH GUIANA: savannah, Pirara, date lacking, *Schomburgk 755* (B, Camb., K, NY, V); Pirara, 1841–2, *Schomburgk 374* (DL, V).

BRAZIL: AMAZONAS: bei der Serra do Stel, Rio Branco; Surumu, Nov., 1909, *Ule 8266* (B, DL); am Igarape Imelu bei Pracana, Rio Branco, Surumu, Febr. 1909, *Ule 7939* (B, DL); Boá Vista, Rio Branco super., silvula secundaria, July 1913, *Kuhlmann 3646* (B); MATTO GROSSO: Coxipo, prope Cuyaba, in margine silvula non in "cerrado," Dec. 27, 1893, *Malmé 1276B* (DL, S); MINAS GERAES: exact locality and date lacking, *Clausen s.n.* (DL); RIO DE JANEIRO: Palmita, date lacking, *Pohl 2214* (Bx, V); exact locality and date lacking, *Glaziou 8800* (Bx); Rio de Janeiro, 1910, *Luetzelburg s.n.* (B, M); SÃO PAULO: Rincão, Jan. 25, 1928, *Toledo 23550* (B); DATA INCOMPLETE: *Pohl s.n.* (Bx); *Clausen 339* (B, BB); *Glaziou 19625* (B).

PERU: LORETO: Tarapoto, Dec., 1902, *Ule 6650* (B, DL).



BOLIVIA: LA PAZ: Ixiamas, alt. 800 ft., Dec. 17, 1921, *Cardeñas 1928* (NY); SANTA CRUZ: im Wald zwischen Rio Pirai und Rio Cuchi bei Santa Cruz, Jan., 1911, *Herzog 1514* (B, S, V).

PARAGUAY: collines herbeuses entre le Cerro-Hu et le Cerro San Tomas, près Paraguari, Jan. 31, 1877, *Balansa 1376* (Bx, DL); in capueras Caaguazu, date lacking, *Jørgensen 4708* (MBG); Villa Concepcion, Febr., 1896, *Anisits s.n.* (S); Cordillera de Altos, Cerro Chochi, Dec. 1902, *Fiebrig 640* (B, DL); Wald, Cordillera de Altos, Dec., 1902, *Fiebrig 647* (B); zwischen Rio Apa und Rio Aquidaban, Centurion, Jan., 1909, *Fiebrig 4462* (B); in regione lacus Ypacaray, Febr., 1913, *Hassler 11547* (B, DL, MBG); in regione cursus superioris fluminis Apa, Nov., 1901, *Hassler 7820* (B, BB, V).

48. *Prestonia bahiensis* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 164. 1860; Miers, Apoc. So. Am. 147. 1878.

Stems relatively stout, densely ferruginous-tomentose, eventually becoming glabrate; leaves broadly oval to oblong-elliptic, apex acuminate to obtuse, base very broadly obtuse or rounded, occasionally very obscurely cordate, 5–16 cm. long, 3.0–7.5 cm. broad, firmly membranaceous, above ferruginously hispid-hirtellous, beneath densely velutinous, the indument dark orange-brown, very lustrous; petioles 0.3–1.0 cm. long, indument as upon the stem; stipular appendages intrapetiolar, several, pectinate-flagelliform, ferruginous-pilosulose, relatively inconspicuous; inflorescence densely subumbellate, simple, bearing 10–30 yellowish flowers; peduncle much shorter than the subtending leaves, indument as on the stem; pedicels 0.4–1.0 cm. long, somewhat accrescent after maturity, ferruginous-tomentulose; bracts linear-lanceolate, 0.7–1.2 cm. long, slightly foliaceous; calyx-lobes ovate-lanceolate, acuminate, densely hispid-hirsutulose, foliaceous, the internal squamellae dentiform-ligular, entire or very minutely erose, minutely pilosulose; corolla salverform, densely ferruginous-villosulose without, the tube 1.5–1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages slightly exserted, 0.25–0.3 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 0.7–0.9 cm. long; stamens inserted somewhat above midway within the corolla-tube, the anthers barely exserted, oblong-sagittate, 0.55–0.6 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, papillate or essentially glabrous; stigma 0.1–0.15 cm.

long; nectaries concrescent, more or less deeply lobed or cleft, fleshy, conspicuously surpassing the ovary; follicles unknown.

BRAZIL: BAHIA: S. Thome, June, 1844, *Blanchet 5776* (BB, Bx, TYPE, DC, MBG, photograph and analytical drawings); MINAS GERAES: Lagoa Santa, 1870, *Warming s.n.* (DC); inter Ponte do Sapueahy et Retero, Jan. 23, 1868, *Regnell III 1600* (B, S); Campo Corrego do Leitão, Belo Horizonte, Aug., year lacking, *Gehrt 5183* (B); Sabara, Jan., 1916, *Hoehe 6874* (B); exact locality and date lacking, *Clausen s.n.* (V); SÃO PAULO: Magy-Mirim, March 20, 1874, *Mosen 1461* (S); DATA INCOMPLETE: *Sellow 1406* (B).

**49. *Prestonia ipomaeifolia* A. DC. in DC. Prodr. 8: 429. 1844; Miers, Apoc. So. Am. 145. 1878.**

*Prestonia Seemannii* Miers, loc. cit. 146. 1878.

Stems relatively slender, somewhat laxly ferruginous-pilose; leaves broadly elliptic to oval, apex very abruptly and shortly acuminate, base broadly obtuse or rounded, 9–14 cm. long, 5–8 cm. broad, firmly membranaceous, above rather sparsely and uniformly hispid-hirtellous, beneath somewhat more densely hispid to hispidulose, the indument dark orange-brown, lustrous; petioles 0.4–0.6 cm. long, indument as on the stem; stipular appendages intrapetiolar, numerous, narrowly pectinate-flagelliform, ferruginous-pilose at the base, relatively conspicuous; inflorescence densely subumbellate, simple, bearing 10–30 yellowish flowers; peduncle much shorter than the subtending leaves, indument as on the stem; pedicels 0.4–0.7 cm. long, somewhat accrescent after maturity, ferruginous-hirtellous; bracts ovate-lanceolate to linear-lanceolate, 0.7–0.9 cm. long, somewhat foliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.9–1.1 cm. long, somewhat foliaceous, 0.9–1.1 cm. long, hispid-hirsute, the internal squamellae broadly dentiform, minutely erose; corolla salverform, densely ferruginous-villous without, the tube 1.7–1.8 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages barely exerted, or about attaining the orifice, 0.15 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 1.2–1.4 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers slightly exerted, oblong-sagittate, 0.6 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, essentially glabrous;

stigma 0.1 cm. long; nectaries conerescent, tubular, barely 5-lobed, fleshy, conspicuously surpassing the ovary; follicles unknown.

PANAMA: PANAMA: Camino del Boticario, near Chepo, alt. 30–50 m., Oct., 1911, Pittier 4700 (G, US).

COLOMBIA: MAGDALENA: Sta. Isabel de Hungaria bei Tucurina, alt. ca. 150 m., Oct. 16, 1926, Schultze 605 (B).

FRENCH GUIANA: Cayenne, date lacking, *le Blond* s.n. (DC, TYPE).

50. *Prestonia calycina* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 162. 1860; Miers, Apoc. So. Am. 146. 1878, not Lindl.

*Prestonia hirsuta* Muell.-Arg. loc. cit. pl. 48. 1860; Miers, loc. cit. 147. 1878, not Spreng.

Stems relatively stout, coarsely ferruginous-hirsute to glabrate; leaves broadly oval to oblong-elliptic, apex very abruptly and shortly acuminate to obtuse or rounded, base broadly obtuse or rounded to obscurely cordate, 9–17 cm. long, 6–13 cm. broad, firmly membranaceous, above appressed ferruginous-hispidulous to scabridulous, occasionally essentially glabrate, beneath densely ferruginous-tomentulose, rarely glabrate; petioles 0.5–1.1 cm. long, ferruginous-tomentulose to glabrate; stipular appendages interpetiolar, numerous, rather broadly pectinate; inflorescence subumbellate, simple, bearing 6–18 yellowish flowers; peduncle much shorter than the subtending leaves, indument as upon the stem; pedicels 0.3–1.0 cm. long, ferruginous-tomentulose to glabrate; bracts ovate to ovate-lanceolate, 0.7–1.4 cm. long, foliaceous; calyx-lobes ovate to oblong-lanceolate, acuminate, 1.2–1.8 cm. long, foliaceous, ferruginous-hirtellous, the internal squamellae irregularly erose or lacerate, sparsely pilosulose; corolla salverform, densely and appressed ferruginous-villosulose, the tube 1.6–2.0 cm. long, about 0.3–0.35 cm. in diameter at the base, epistaminal appendages barely exerted, or about attaining the orifice, 0.25–0.4 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 1.2–1.5 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers barely exerted, oblong-sagittate, 0.5–0.7 cm. long, more or less puberulent dorsally, rarely nearly glabrate; ovary ovoid, about

0.15 cm. long, glabrous; stigma 0.1–0.15 cm. long; nectaries crescent, broadly tubular, more or less deeply 5-lobed, fleshy, conspicuously surpassing the ovary; follicles stout and rigid, narrowly napiform, sharply divaricate, 6.5–7.0 cm. long, retrorsely hirtellous to obsoletely scabridulous; seeds 1.1–1.2 cm. long, the pale tawny coma 3.0–3.5 cm. long.

BRAZIL: RIO DE JANEIRO: Cantogallo, 1861, *Peckholt 559* (Bx); exact locality lacking, *Beyrich s.n.* (B); *Glaziou 12944* (B); *Glaziou 8173* (B); DATA INCOMPLETE: *Pohl 5167* (V, MBG, photograph and analytical drawings); *Sellow 550* (B); *Glaziou 18363* (B).

PARAGUAY: in regione cursus superioris fl. Y-aca, Dec., 1900, *Hassler 6776* (B, BB, V).

*Hassler 6776* is more nearly glabrate than the majority of the Brazilian representatives, but is surpassed in this respect by *Glaziou 18363*, from an unspecified locality in Brazil. The specimens cited appear conspecific in all essential respects.

**51. *Prestonia cordifolia* Woodson, spec. nov.**

Ut creditur suffruticosa vel fruticosa volubilis; ramulis sat gracilibus dense ferrugineoque puberulo-tomentulosis; foliis oppositis manifeste petiolatis ovatis vel ovato-ellipticis apice abrupte acuminatis basi conspicue cordatis superne late obtusis rotundatisve 6–12 cm. longis 4–9 cm. latis firmiter membranaceis supra minute scabridulo-puberulis subtus dense ferrugineo-tomentulosis; petiolis 1.3–1.5 cm. longis ut in ramulo vestitis; appendicibus stipulaceis interpetiolaribus inconspicue dentiformibus utroque latere 3–4; inflorescentiis simplicibus corymbosis foliis multo brevioribus flores (ut creditur aut gilvos aut flavos) 8–10 gerentibus; pedunculo dense ferrugineo-tomentuloso petiolis subaequante; pedicellis 1.0–1.2 cm. longis ut in pedunculo vestitis; bracteis oblongo-lanceolatis 1.0–1.5 cm. longis foliaceis minute ferrugineo-puberulis; calycis laciniis ovato-oblongis abrupte acuminatis basi usque  $\frac{1}{3}$  altitudinem connatis 2.0–2.2 cm. longis extus leviter intusque minute ferrugineo-puberulis squamellis inconspicuis late triangulo-deltiformibus integerrimis apice obtusis ca. 0.05 cm. longis minutissime puberulis; corollae salverformis tubo 2.0–2.2 cm. longo basi ca. 0.18–0.2 cm. diametro

metiente faucibus 0.25–0.3 cm. diametro metientibus extus omnino minute ferrugineo-puberulo intus supra insertionem staminum retrorse pilosulo appendicibus epistaminalibus oblongis 0.45–0.5 cm. longis conspicue exsertis annulo faucium manifeste incrassato, lobis oblique obovato-oblongis 2.0–2.2 cm. longis patentibus extus minute ferrugineo-puberulis intus glabris; staminibus prope fauces insertis antheris conspicue exsertis lanceolato-sagittatis 0.7–0.75 cm. longis dorso minute hispidulis; stigmatibus oblongo-subcapitato 0.17 cm. longo; ovario ovoido ca. 0.2 cm. longo glabro; nectariis conrescentibus haud conspicue lobatis incrassatis ovarium ca. dimidio aequantibus; folliculis ignotis.

Stems relatively slender, densely ferruginous-tomentulose; leaves opposite, petiolate, ovate to ovate-elliptic, apex abruptly acuminate, base conspicuously cordate to broadly obtuse or rounded above, 6–12 cm. long, 4–9 cm. broad, firmly membranaceous, above minutely scabridulous-puberulous, beneath densely ferruginous-tomentulose; petioles 1.3–1.5 cm. long, minutely ferruginous-tomentulose; stipular appendages interpetiolar, inconspicuously dentiform, 3–4 upon either side of the node; inflorescence simple, corymbose, much shorter than the leaves, bearing 8–10 (probably yellowish or cream-colored) flowers; peduncle densely ferruginous-tomentulose, about equalling the subtending petioles; pedicels 1.0–1.2 cm. long, the indument as upon the peduncle; bracts conspicuously foliaceous, oblong-lanceolate, 1.0–1.5 cm. long, very minutely ferruginous-puberulous; calyx-lobes ovate-oblong, abruptly acuminate, connate at the base for about  $\frac{1}{3}$  their length, 2.0–2.2 cm. long, conspicuously foliaceous, without softly and densely, within minutely ferruginous-puberulous, the squamellae broadly triangular-deltiform, entire, the apex broadly obtuse, about 0.05 cm. long, very minutely puberulent; corolla salverform, the tube 2.0–2.2 cm. long, about 0.18–0.2 cm. in diameter at the base and 0.25–0.3 cm. in diameter at the orifice, minutely ferruginous-hirtellous or -puberulous without, retrorsely pilosulose within above the insertion of the stamens, epistaminal appendages oblong, 0.45–0.5 cm. long, conspicuously



exserted, faucal annulus conspicuously thickened; lobes obliquely obovate-oblong, 2.0-2.2 cm. long, reflexed, without minutely ferruginous-puberulent, within glabrous; stamens inserted near the orifice of the corolla-tube, the anthers conspicuously exserted, lanceolate-sagittate, 0.7-0.75 cm. long, minutely hispidulous dorsally; ovary ovoid, about 0.2 cm. long, glabrous; stigma oblong-subcapitate, 0.17 cm. long; nectaries conerescent, scarcely lobed, greatly thickened, about half equalling the ovary; follicles unknown.

PERU: CAJAMARCA: Catache, Prov. Contumaza, alt. 5000 ft., May 27, 1875, *Raimondi 8228* (B, TYPE, MBG, photograph and analytical drawings).

Closely related to *P. calycina* Muell.-Arg., but differing, in addition to the key characters, in such features as the vegetative induments, stipular appendages, length and degree of connation of calyx-lobes, and character of the squamellae.

**52. *Prestonia brachypoda* Blake, Contr. U. S. Nat. Herb. 20: 530. 1924.**

Stems relatively stout, ferruginous-velutinous when young, soon becoming scabridulous to glabrate; leaves broadly obovate-oblong, apex obtuse to rounded, base obscurely cordate, 14-25 cm. long, 9-12 cm. broad, firmly membranaceous, above sparsely ferruginous-pilosulose, beneath densely and minutely ferruginous-velutinous; petioles 0.3-0.5 cm. long, very minutely ferruginous-vellutinous; stipular appendages interpetiolar, numerous, pectinate-flagelliform, sparsely and minutely pilosulose; inflorescence densely subumbellate-capitate, simple, bearing 3-6 yellowish flowers; peduncle extremely short, scarcely surpassing the subtending petioles, ferruginous-pubescent; pedicels 0.7-0.8 cm. long, minutely appressed-puberulent; bracts linear-lanceolate, long-acuminate, 0.4-0.6 cm. long, slightly foliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.8-0.9 cm. long, somewhat foliaceous, minutely appressed-puberulent, the internal squamellae broadly dentiform-ligular, entire or very minutely erose or emarginate; corolla salverform, appressed ferruginous-villosulose without, the tube 1.5-1.7 cm. long, about 0.25 cm. in diameter at the base, epistaminal

appendages slightly exserted, 0.3–0.35 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, shortly acuminate, 0.6–0.7 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers barely exserted, oblong-sagittate, 0.5 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous; stigma 0.1–0.15 cm. long; nectaries conerescent, somewhat fleshy, tubular or subtubular, broadly 5-lobed, conspicuously surpassing the ovary; follicles unknown.

VENEZUELA: CARABOBO: Guaremales, road from Puerto Cabello to San Felipe, in forest, alt. 10–100 m., May 15–29, 1920, *Pittier 8832* (G, US, TYPE, MBG, photograph and analytical drawings).

**53. *Prestonia mucronata* Rusby, Descr. So. Am. Pl. 90. 1920.**

Stems relatively slender, densely and minutely ferruginous-tomentose, eventually becoming glabrate when fully mature; leaves broadly oval, apex very abruptly and shortly acuminate, base broadly obtuse or rounded, 4–8 cm. long, 3–5 cm. broad, firmly membranaceous, above rather sparsely and minutely ferruginous-hispidulose, beneath minutely and rather sparsely ferruginous-hirtellous; petioles 0.7–1.5 cm. long, minutely ferruginous-tomentulose; stipular appendages interpetiolar, numerous, minutely pectinate-flagelliform, very minutely ferruginous-pilosulose at the base; inflorescence subumbellate, simple, bearing 4–12 yellowish flowers, peduncle minutely ferruginous-tomentulose, somewhat shorter than the subtending leaves; pedicels 1.0–1.2 cm. long, somewhat accrescent after maturity, minutely ferruginous-tomentulose; bracts narrowly lanceolate, 0.2–0.5 cm. long; calyx-lobes oblong-elliptic, acute to acuminate, 0.9–1.2 cm. long, somewhat foliaceous, minutely appressed ferruginous-puberulent, the internal squamellae broadly deltoid-dentiform, very minutely erose, minutely puberulent-papillate; corolla salverform, minutely ferruginous-puberulent without, the tube 0.9–1.2 cm. long, about 0.2 cm. in diameter at the base, dilated to about 0.4 cm. at the orifice, epistaminal appendages wholly included, 0.1–0.15 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 0.9–1.0 cm.

long, reflexed or widely spreading; stamens inserted slightly above midway within the corolla-tube, the anthers barely included, very narrowly sagittate, 1.0–1.1 cm. long, glabrous; ovary ovoid, about 0.1 cm. long, glabrous or essentially so; stigma 0.2 cm. long; nectaries more or less conerescent at the base, compressed-oblongoid, truncate or slightly erose at the tips, more or less fleshy, conspicuously surpassing the ovary; follicles unknown.

COLOMBIA: MAGDALENA: occasional in damp, somewhat open places in the forest and clearings near streams, alt. 4500–6000 ft., Las Nubes, Dec. 18, 1898, H. H. Smith 1656 (DL, MBG, NY, TYPE, S).

**54. *Prestonia parviflora* Benth.** in Benth. & Hook. Gen. Pl. 2: 709. 1876.

*Haemadictyon parviflorum* Benth. Pl. Hartw. 355. 1857.

*Temnadenia parviflora* (Benth.) Miers, Apoc. So. Am. 215. 1878.

Stems relatively slender, densely ferruginous-tomentulose, eventually becoming glabrate; leaves rather broadly elliptic, apex shortly acuminate, base broadly obtuse, 7–13 cm. long, 2.5–6.0 cm. broad, firmly membranaceous, above rather sparsely and minutely hispid-hirtellous, more densely along the midrib and veins, beneath densely and ferruginously sericeous-velutinous; petioles 0.8–1.5 cm. long, densely ferruginous-tomentulose; stipular appendages interpetiolar, numerous, pectinate-flagelliform, minutely pilosulose below; inflorescence corymbose to thyrsiform, repeatedly dichotomous, bearing many small, yellowish flowers; peduncle minutely ferruginous-tomentulose, somewhat shorter than the subtending leaves; pedicels 0.4–0.6 cm. long, somewhat accrescent after maturity, minutely ferruginous-tomentulose; bracts minutely linear-lanceolate, 0.1–0.3 cm. long; calyx-lobes ovate-lanceolate, acuminate, 0.3–0.4 cm. long, densely and minutely ferruginous-puberulent, the internal squamellae dentiform, minutely pectinate; corolla salverform, minutely and appressed ferruginous-villosulose without, the tube 0.5–0.6 cm. long, about 0.1 cm. in diameter at the base, somewhat dilated above the insertion of the stamens, epistaminal appendages wholly included, about

0.1 cm. long, faucal annulus conspicuously thickened, the lobes obliquely obovate, very shortly acuminate, 0.6–0.7 cm. long, reflexed or widely spreading; stamens inserted about midway within the corolla-tube, the anthers slightly exerted, sagittate, 0.35 cm. long, glabrous; ovary ovoid, about 0.1 cm. long, minutely papillate; stigma 0.05 cm. long; nectaries imperfectly concrescent, rather thin, somewhat shorter than the ovary; follicles unknown.

COLOMBIA: CUNDINAMARCA: Pandi, date lacking, *Hartweg 1053* (Camb., K, TYPE); Cena, Prov. de Bogota, alt. 1300 m., 1851–57, *Triana s.n.* (Bx, MBG, photograph and analytical drawings); DATA INCOMPLETE: *Triana 1979* (B).

55. *Prestonia mexicana* A. DC. in DC. Prodr. 8: 429. 1844; K. Sch. in Engl. & Prantl, Nat Pflanzenfam. 4<sup>2</sup>: 188. 1895.

*Haemadictyon Mexicanum* A. DC. loc. cit. 428. 1844.

*Prestonia sericea* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 360. 1844.

*Haemadictyon contortum* Mart. & Gal. loc. cit. 1844.

*Mitozus Mexicanus* (A. DC.) Miers, Apoc. So. Am. 225. 1878.

*Exothostemon sericeum* (Mart. & Gal.) Miers, loc. cit. 241. 1878.

*Exothostemon contortum* (Mart. & Gal.) Miers, loc. cit. 1878.

Stems relatively stout, densely ferruginous-tomentose, eventually becoming glabrate; leaves broadly ovate to oval or obovate-elliptic, apex acute to very abruptly and shortly acuminate, base rounded to obscurely cordate, 7–23 cm. long, 4–15 cm. broad, firmly membranaceous, above ferruginously hispid-hirtellous to scabridulous upon older specimens, beneath densely ferruginous-tomentose; petioles 0.3–0.9 cm. long, ferruginous-tomentulose; stipular appendages intrapetiolar, numerous, pectinate-flagelliform, ferruginous-tomentulose below; inflorescence closely subumbellate, simple, bearing 8–20 yellowish flowers; peduncle much shorter than the subtending leaves, indument as upon the stem; pedicels 0.5–1.0 cm. long, ferruginous-tomentulose; bracts ovate-lanceolate, acuminate, 0.6–1.7 cm. long, foliaceous; calyx-lobes ovate- to oblong-

lanceolate, acute to acuminate, 1.2–2.3 cm. long, foliaceous, appressed-tomentulose, the internal squamellae broadly denticulate, minutely erose to essentially entire; corolla salverform, densely ferruginous-villosulose without, the tube 2.2–3.0 cm. long, about 0.3–0.35 cm. in diameter at the base, epistaminal appendages replaced by linear callous ridges 0.2–0.25 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 1.3–1.5 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers slightly exserted, oblong-sagittate, 0.6–0.8 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, minutely papillate or essentially glabrous; nectaries concrescent, annular, broadly 5-lobed or essentially entire, about equalling or slightly surpassing the ovary; follicles stout and rigid, sharply divaricate, narrowly napiform, 6–12 cm. long, densely and rigidly ferruginous-hispid; seeds 1.0–1.2 cm. long, the pale tawny coma 2.5–3.0 cm. long.

MEXICO: COLIMA: Manzanillo, Dec. 1–31, 1890, *E. Palmer 1028* (B, G); MORELOS: barranca near Cuernavaca, alt. 4700 ft., June 17, 1896, *Pringle 6341* (B, Bx, BB, DL, G, M, MBG, V); same locality, alt. 5000 ft., Nov. 13, 1895, *Pringle 6224* (B, Bx, BB, DL, G, M, MBG, V); VERA CRUZ: Valle de Cordova, Oct. 15, 1865, *Bourgeau 1500* (B, S); Wartenberg, near Tantoyuca, 1858, *Ervenberg 127* (DC); Zacuapan, June, 1916, *Purpus 7665* (MBG); open forests, Zacuapan, 1928, *Purpus 11134* (MBG); OAXACA: Ojitlan, alt. 700 ft., Aug. 31, 1895, *L. C. Smith 661* (G); San Bartolo, Aug., year lacking, *Andrieux 251* (M); DATA INCOMPLETE: *Schiede 488* (B); *Pavon s.n.* (BB); *Andrieux 398* (DC).

GUATEMALA: SANTA ROSA: Naranjo, alt. 1100 m., May, 1893, *Heyde & Lux 4496* (B, BB, M, MBG); DATA INCOMPLETE: *Warszewicz s.n.* (B).

*Haemadictyon Mexicanum* A. DC., based upon a tracing of a plant of Mociño & Sesse, diverges from typical *P. mexicana* only in the absence of the heavy indument characteristic of the latter species. This absence is considered to be an omission rather than a positive indication of glabrisms, since the thick napiform-fusiform follicles illustrated for Mociño & Sesse's plant are only found in a relatively small group of species always bearing a characteristic ferruginous indument. Upon the basis of a wide representation of the Mexican flora, only one species of *Prestonia* with thick follicles is known, *P. mexicana*; consequently *H. Mexicanum* has been placed in synonymy



under it. The peculiar conditions under which the tracings of Mociño & Sesse's plants were prepared would also support the supposition of an accidental omission of the indument.

**56. *Prestonia amanuensis* Woodson, spec. nov.**

Suffruticosa volubilis; ramulis crassiusculis ferrugineo-tomentosis; foliis late ovatis apice abrupte brevissimeque acuminatis basi late obscureque cordatis 6-9 cm. longis 4-7 cm. latis rigide membranaceis supra dense ferrugineo-hispidulis subtus densius ferrugineo-tomentulosus; petiolis 0.2-0.3 cm. longis ut in ramulo vestitis; appendicibus stipulaceis intrapetiolaribus multis minute pectinatis; inflorescentiis dense subumbellatis simplicibus flores gilvos 6-12 gerentibus; pedunculo foliis multo brevior ut in ramulo vestito; pedicellis 0.3-0.5 cm. longis post maturitatem paulo accrescentibus ferrugineo-tomentulosus; bracteis ovato-lanceolatis acuminatis 0.3-0.7 cm. longis foliaceis; calycis laciniis ovato-lanceolatis acuminatis 1.1-1.3 cm. longis foliaceis minute appresseque hirtellis squamellis dentiformibus minute emarginatis erosive; corollae salverformis extus dense appresseque ferrugineo-villosulae tubo 2.0-2.2 cm. longo basi ca. 0.3 cm. diametro metiente intus plicas subquadratas callosas ca. 0.1-0.15 cm. longas pro appendicibus epistaminalibus gerente faucibus callosis lobis oblique obovatis breviter acuminatis 0.8-0.9 cm. longis patentibus; staminibus prope fauces insertis antheris paululo exsertis sagittatis 0.6 cm. longis glabris; ovario ovoideo ca. 0.14 cm. longo glabriusculo; stigmatibus 0.2 cm. longo; nectariis con crescentibus annularibus subintegris ovario subaequantibus; folliculis ignotis.

Stems relatively stout, ferruginous-tomentose; leaves broadly ovate, apex abruptly and shortly acuminate, base broadly and obscurely cordate, 6-9 cm. long, 4-7 cm. broad, firmly membranaceous, above densely ferruginous-hispidulous, beneath densely ferruginous-tomentulose; petioles 0.2-0.3 cm. long, indument as upon the stem; stipular appendages intrapetiolar, numerous, minutely pectinate; inflorescence densely subumbellate, simple, bearing 6-12 cream-colored flowers; peduncle much shorter than the subtending leaves, ferrugi-

nous-tomentose; pedicels 0.3–0.5 cm. long, somewhat accrescent after maturity, ferruginous-tomentulose; bracts ovate-lanceolate, acuminate, 0.3–0.7 cm. long, foliaceous; calyx-lobes ovate-lanceolate, acuminate, 1.1–1.3 cm. long, foliaceous, minutely appressed-hirtellous, the internal squamellae dentiform, minutely emarginate or erose; corolla salverform, densely and appressed ferruginous-villosulose without, the tube 2.0–2.2 cm. long, about 0.3 cm. in diameter at the base, epistaminal appendages replaced by callous subquadrate protuberances 0.1–0.15 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 0.8–0.9 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exserted, sagittate, 0.6 cm. long, glabrous; ovary ovoid, about 0.14 cm. long, essentially glabrous; stigma 0.2 cm. long; nectaries concrescent, annular, essentially entire, about equalling the ovary; follicles unknown.

BRITISH HONDURAS: growing over low bushes in open places, rare, Stann Creek Railway, alt. 50 ft., Aug. 29, 1929, *Schipp 87* (B, TYPE, G, MBG, photograph and analytical drawings).

Similar to *P. mexicana*, to which it is doubtless closely related, but differing in its smaller, more shortly petiolate leaves, smaller flowers, and particularly in the shape and size of the epistaminal protuberances of the corolla as indicated in the key to species.

**57. *Prestonia isthmica* Woodson, Ann. Mo. Bot. Gard. 18: 555. 1931.**

*Prestonia longituba* K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 188. 1895, nom. subnud.

Stems relatively stout, rather finely ferruginous-tomentulose to glabrate, conspicuously lenticellate when fully mature; leaves broadly obovate to oblong-elliptic, apex abruptly and shortly acuminate, base obtuse or rounded, rather obscurely cordate, 9–22 cm. long, 5–13 cm. broad, firmly membranaceous, above rather minutely and sparsely hirtellous-strigillose, beneath minutely ferruginous-tomentulose; petioles 0.3–1.2 cm.

long, indument as upon the stem; stipular appendages intrapetiolar, rather broadly pectinate; inflorescence densely subumbellate, simple, bearing 4–12 yellowish flowers; peduncle much shorter than the subtending leaves, indument as upon the stem; pedicels 0.5–1.0 cm. long, somewhat accrescent after maturity, minutely ferruginous-tomentulose-papillate; bracts ovate-lanceolate, 0.7–1.2 cm. long, foliaceous; calyx-lobes ovate to ovate-lanceolate, acuminate, 2.0–2.5 cm. long, foliaceous, minutely and rather irregularly hirtellous-papillate without, the internal squamellae broadly dentiform-ligular, minutely erose or lacerate, pilosulose; corolla salverform, ferruginous-villosulose without, the tube 2.5–3.5 cm. long, about 0.3–0.4 cm. in diameter at the base, epistaminal appendages replaced by callous linear ridges 0.2–0.25 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 1.3–1.7 cm. long, reflexed or widely spreading; stamens inserted at about the upper  $\frac{1}{4}$  of the corolla-tube, the anthers oblong-sagittate, 0.6–0.8 cm. long, glabrous; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.15–0.2 cm. long; nectaries conerescent, tubular, deeply 5-lobed, fleshy, conspicuously surpassing the ovary; follicles stout and rigid, narrowly napiform, sharply divaricate, 7–12 cm. long, densely and rigidly ferruginous-hispid; seeds 1.0–1.6 cm. long, the bright tawny coma 3.5–4.5 cm. long.

COSTA RICA: GUANACASTE: collines de Nicoya, May, 1900, *Tondus* 13945 (B); ALAJUELA: buissons, haies, aux collines de Santiago près S. Ramon, May 31, 1901, *Brenes* 14276 (B, G); buissons au bord du Tiliri à la Verbena, près Alajuelita, Aug., 1894, *Tondus* 8904 (Bx); SAN JOSE: wet thicket, between Aserri and Tarbaca, alt. 1200–1700 m., Dec. 6, 1925, *Standley* 41332 (US, TYPE, MBG, photograph and analytical drawings); Rio Virilla, alt. 1160 m., Oct., 1898, *Tondus* 7441 (B, BB); Rio Virilla près de San Juan, Oct., 1898, *Tondus* 12711 (BB, M, V); S. Jose, date lacking, *Hoffmann* 522 (B); PUNTARENAS: forêt du R. Ceibo, près Buenos Aires, alt. 200 m., Febr., 1892, *Pittier* 6652 (Bx).

**58. *Prestonia speciosa* Donn. Sm. Bot. Gaz. 27: 435. 1899.**

Stems relatively stout, ferruginous-tomentose, eventually becoming glabrate; leaves ovate to ovate-elliptic, apex abruptly and shortly acuminate, base broadly obtuse or rounded, 10–17 cm. long, 7–11 cm. broad, firmly membranaceous, above rather

sparsely and minutely hispidulous-strigillose generally, densely ferruginous-tomentulose upon the midrib and veins, beneath finely and minutely ferruginous-tomentulose generally; petioles 0.5–1.2 cm. long, densely ferruginous-tomentulose; stipular appendages interpetiolar, numerous, pectinate-flagelliform; inflorescence subumbellate, simple, bearing 4–8 bright yellow flowers; peduncle scarcely surpassing the subtending petioles, or slightly shorter, ferruginous-tomentulose; pedicels 1.0–1.5 cm. long, somewhat accrescent after maturity, minutely ferruginous-tomentulose; bracts narrowly lanceolate, 0.2–0.5 cm. long, slightly foliaceous; calyx-lobes ovate to ovate-oblong, acute, 1.2–1.5 cm. long, minutely and rather irregularly hirtellous, the internal squamellae broadly dentiform-deltoid, minutely emarginate or erose; corolla infundibuliform, minutely ferruginous-villosulose without, the proper-tube 1.5–1.7 cm. long, about 0.35 cm. in diameter at the base, the throat rather narrowly conical-campanulate, 1.5–1.6 cm. long, about 0.8–0.9 cm. in diameter at the orifice, epistaminal appendages replaced by rather inconspicuous, callous, obtriangular, foveolate protuberances 0.1–0.12 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, shortly acuminate, 2.0–2.5 cm. long, widely spreading; stamens inserted at the base of the corolla-throat, the anthers included, oblong-sagittate, 0.8 cm. long, glabrous; ovary ovoid, about 0.15 cm. long, glabrous or minutely papillate; stigma 0.15 cm. long; nectaries concrescent, annular, rather obscurely and irregularly lobed, fleshy, somewhat surpassing the ovary; follicles unknown.

GUATEMALA: SANTA ROSA: Buena Vista, alt. 1700 m., April, 1893, *Heyde & Luz* 4497 (B, BB, G, US, TYPE, MBG, photograph and analytical drawings).

SALVADOR: LA LIBERTAD: cultivated in the garden of the finca, Puerta de la Laguna, April 27, 1922, *Standley 23673* (G, US).

**59. *Prestonia Riedelii* (Muell.-Arg.) Mgf. in Fedde, Rep. Spec. Nov. 20: 26. 1924.**

*Haemadictyon Riedelii* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 170. 1860.

*Temnadenia Riedelii* (Muell.-Arg.) Miers, Apoc. So. Am. 216. 1878.

*Prestonia Muelleri* Rusby, Mem. Torrey Bot. Club 4: 217. 1895.

*Echites* (?) *Riedelii* (Muell.-Arg.) Malme, Bull. Herb. Boiss. II. 4: 196. 1904.

Stems relatively stout, rather finely ferruginous-tomentose to glabrate; leaves broadly ovate to ovate-elliptic, apex acute to acuminate, base broadly obtuse to rounded, 5–18 cm. long, 3–11 cm. broad, membranaceous, above densely hispiduloustrigillose to essentially glabrate, beneath minutely tomentulose to sparsely and irregularly puberulent or pilosulose; petioles 0.7–4.0 cm. long, indument as upon the stem; stipular appendages intrapetiolar, extremely inconspicuous, pectinate; inflorescence bostrychoid-racemose, simple, relatively lax and elongate, bearing 20–45 brownish-yellow flowers; peduncle somewhat shorter than the subtending leaves, indument as upon the stem; pedicels 1.5–2.0 cm. long, somewhat accrescent after maturity, minutely tomentulose; bracts lanceolate to narrowly ovate-lanceolate, 0.5–3.3 cm. long, foliaceous; calyx-lobes elliptic-lanceolate, acuminate, 0.8–2.0 cm. long, foliaceous, minutely puberulent, the internal squamellae broadly deltoid-dentiform, minutely and irregularly erose to essentially entire; corolla salverform, rather indistinctly and irregularly puberulent without, the tube 1.3–1.5 cm. long, about 0.25 cm. in diameter at the base, epistaminal appendages replaced by callous, linear ridges 0.15–0.3 cm. long, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely oblong-elliptic to obovate, 1.1–1.7 cm. long, reflexed or widely spreading; stamens inserted at slightly below midway within the corolla-tube, the anthers wholly included, narrowly oblong-sagittate, shortly auriculate, 0.55–0.65 cm. long, sparsely pilosulose; ovary ovoid, 0.1–0.125 cm. long, minutely papillate; stigma 0.125–0.15 cm. long; nectaries separate or essentially so, compressed-obovoid or oblong-obovoid, about as long as the ovary; follicles relatively elongate and slender, somewhat articulated, usually more or less falcate, occasionally persistently



united at the tips until maturity, 10–25 cm. long, minutely and densely hispidulous; seeds 1.1–1.3 cm. long, obsoletely rostrate, the pale tawny coma about 2.5 cm. long.

PERU: AYACUCHO: Aina, between Huanta and Rio Apurimac, open woods, alt. 750–1000 m., May 7–17, 1929, *Killip & Smith 22708* (US).

BOLIVIA: LA PAZ: Milluhuaya, alt. 1300 m., Dec., 1917, *Buchtien 277* (MBG); Polo-Polo bei Coroico, alt. 1100 m., Oct.–Nov., 1912, *Buchtien 279* (B, DL, MBG); "Yungas," 1890, *Bang 403* (B, BB, DL, G, M, MBG); TARIJA: Soledad bei S. Luis, Wald, alt. 1500 m., Jan. 30, 1904, *Fiebrig 2675* (B, DL, M, U, V); SANTA CRUZ: Cuesta Negra, alt. 1200 m., Dec. 23, 1921, *Steinbach 6065* (B); Samaipata, Valleggrande, alt. 1200 m., March 10, 1920, *Steinbach 3732* (B); im Wald der Quebrada de Charagua, Dec., 1910, *Herzog 11230* (B, DL).

PARAGUAY: in regione fl. Alto Parana, 1909–10, *Fiebrig 5947* (B); in reg. collum "Cerros de Tobaty," Sept., 1900, *Hassler 6424* (B, V); in reg. lacus Ypacaray, April, 1913, *Hassler 12166* (C, MBG); ad ripam Piribibuey, Aug., year lacking, *Hassler 3211* (B, V); in altaplanitie et declivibus "Sierra de Amambay," Dec., 1907, *Rojas 9768a* (B); Cordillera de Altos, Aug., 1902, *Fiebrig 64* (B, DL, M); zwischen Rio Apa und Rio Aquidaban, San Luis, Dec., 1908, *Fiebrig 4447* (B, G, M); in reg. collum, Cordillera de Villa-Rica, Jan., 1905, *Hassler 8678* (B).

BRAZIL: SÃO PAULO: campinas, date lacking, *Novae 11207* (B); Canna Velha, April, 1848, *Regnell III 884* (S); data incomplete, *De Jonghe s.n.* (Camb.); PARANA: ad marginem silvulae, Jaguariahyva, alt. 740 m., April 15, 1911, *Dusen 11624* (MBG, S); ad marginem silvulae, Itarare opp., alt. 730 m., Jan. 21, 1915, *Dusen 16454* (MBG, S, US); Villa Velha, in campo, Febr. 4, 1905, *Dusen 7699* (S).

ARGENTINA: MISIONES: Posadas, La Granja, Dec. 3, 1907, *Ekman 1592* (S).

This is a relatively uniform species. It departs from other representatives of § *Tomentosae* in the relatively scant indument of the corolla. The color of the corolla is reported by Herzog as "rot-braun mit gelbem schlund."

#### 60. *Prestonia Schumanniana* Woodson, spec. nov.

Suffruticosa volubilis; ramulis gracilibus minute ferrugineo-tomentulosus; foliis late ellipticis apice abrupte breviterque acuminatis basi obtusis 12–15 cm. longis 5–8 cm. latis rigide membranaceis supra sparse minutissimeque strigilloso-papillatis nervo medio nervisque minute ferrugineo-pilosulis subtus minutissime ferrugineo-tomentulosus; petiolis 1.1–1.5 cm. longis minutissime tomentulosus; appendicibus stipulaceis interpetiolaribus multis minute pectinatis; inflorescentiis subumbellatis simplicibus vel obscure dichotomis flores 6–12 luteos

gerentibus; pedunculo petiolis subaequante minute ferrugineo-tomentuloso; pedicellis 1.0–1.1 cm. longis post maturitatem paulo accrescentibus minutissime tomentulosis; bracteis ovatis 0.1–0.3 cm. longis; calycis laciniis oblongo-ellipticis apice acutis 0.9–1.1 cm. longis foliaceis minute hirtello-papillatis squamellis late dentiformibus minute emarginatis puberulis; corollae salverformis extus minute ferrugineo-villosulae tubo 1.5 cm. longo basi ca. 0.2 cm. diametro metiente intus plicas callosas minutas late oblongas pro appendicibus epistaminalibus gerente annulo faucium conspicue incrassato tumido lobis oblique obovatis brevissime acuminatis 1.0–1.2 cm. longis patentibus; antheris paululo exsertis elliptico-sagittatis 0.7 cm. longis glabris; ovario ovoideo ca. 0.2 cm. longo glabro; stigmatate 0.2 cm. longo; nectariis basi conerescentibus carnosae ovarium paulo superantibus; folliculis ignotis.

Stems relatively slender, minutely ferruginous-tomentulose; leaves broadly elliptic, apex abruptly and shortly acuminate, base obtuse, 12–15 cm. long, 5–8 cm. broad, firmly membranaceous, above sparsely and very minutely strigillose-papillate generally, the midrib and nerves minutely ferruginous-pilose, beneath very minutely ferruginous-tomentulose; petioles 1.1–1.5 cm. long, very minutely tomentulose; stipular appendages interpetiolar, numerous, minutely pectinate; inflorescence subumbellate, congested, simple, or obscurely dichotomous, bearing 6–12 yellowish flowers; peduncle about as long as the subtending petioles, minutely ferruginous-tomentulose; pedicels 1.0–1.1 cm. long, slightly accrescent after maturity, very minutely tomentulose; bracts ovate, 0.1–0.3 cm. long; calyxlobes oblong-elliptic, acute, 0.9–1.1 cm. long, foliaceous, minutely hirtellous-papillate, the internal squamellae broadly dentiform, minutely emarginate, puberulous; corolla salverform, minutely ferruginous-villosulose without, the tube 1.5 cm. long, about 0.2 cm. in diameter at the base, epistaminal appendages replaced by broadly oblong, callous ridges, faucal annulus conspicuously thickened or tuberculate, the lobes obliquely obovate, very shortly acuminate, 1.0–1.2 cm. long, re-

flexed or widely spreading; stamens inserted slightly above midway within the corolla-tube, the anthers barely exerted, elliptic-sagittate, 0.7 cm. long, glabrous; ovary ovoid, about 0.2 cm. long, glabrous; stigma 0.2 cm. long; nectaries conerescent at the base, fleshy, somewhat surpassing the ovary; follicles unknown.

ECUADOR: GUAYAS: Balao, May, 1892, *Eggers 14722* (M, TYPE, MBG, photograph and analytical drawings).

Important features of morphology distinguish this species from *P. Riedelii*, the only other representative of § *Tomentosae* in South America with the epistaminal appendages replaced by callous ridges. These may be summarized as follows:

|                     | <i>P. Riedelii</i>                         | <i>P. Schumanniana</i>                                    |
|---------------------|--|---|
| Inflorescence:      | simple, lax and elongate.                  | simple or obscurely dichotomous, congested, subumbellate. |
| Anthers:            | included, pilosulose, auricles very short. | barely exerted, glabrous, auricles long and slender.      |
| Epistaminal ridges: | linear.                                    | broadly oblong.   |

#### EXCLUDED OR UNCERTAIN SPECIES

*Prestonia Goudotiana* Baill. Bull. Mens. Soc. Linn. Paris 1: 792. 1889, nom. subnud. Possibly refers to a species of § *Tomentosae*. The nectaries are briefly described, without citation of specimens or other characters by means of which interpretation can be based.

*Prestonia hirsuta* (R. & P.) Spreng. Syst. 1: 637. 1825, not Muell.-Arg. (*Echites hirsuta* R. & P. Fl. Peruv. 2: 19. pl. 136. 1799, not A. Rich.) = *Mandevilla Pavonii* (A. DC.) Woodson, Ann. Mo. Bot. Gard. 19: 73. 1932 (*Echites Pavonii* A. DC. in DC. Prodr. 8: 463. 1844).

*Prestonia Langlassei* Standl. Contr. U. S. Nat. Herb. 23: 1159. 1924 = *Laubertia Pringlei* (Greenm.) Woodson, Ann. Mo.

Bot. Gard. 18: 555. 1931 (*Streptotrachelus Pringlei* Greenm. Proc. Am. Acad. 32: 298. 1897).

*Prestonia peruviana* Spreng. loc. cit. 1825 = *Mandevilla glandulosa* (R. & P.) Woodson, loc. cit. 66. 1932 (*Echites glandulosa* R. & P. loc. cit. pl. 135. 1799).

*Haemadictyon bracteosum* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 168. 1860. I have not been able to examine the type specimen of this species, collected by Riedel near Rio de Janeiro. The description accords with that of *Prestonia perplexa* Woodson (*vide ante*) in all essential characters save the elaborate bracts, which the specific adjective commemorates. In view of that fact, it appears wise to maintain the entities separate.

#### XXVII. RHODOCALYX Muell.-Arg.

*Rhodocalyx* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 172. 1860; Miers, Apoc. So. Am. 138. 1878 (as to *Rh. rotundifolius*).

Lactescent, suffrutescent herbs. Stems terete, erect, simple, or branching at the very base. Leaves opposite, petiolate, entire, penninerved, eglandular, the petioles exappendiculate or essentially so. Inflorescence terminal, simply racemose, conspicuously bracteate. Calyx 5-parted, the lobes somewhat unequal, imbricated, cleft nearly to the receptacle, conspicuously foliaceous or subpetaloid, bearing within at the base deeply lacerate, opposite squamellae. Corolla salverform, exappendiculate within, the orifice of the tube conspicuously annulate, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, included, the anthers connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged, narrowly sagittate connective; pollen granular. Carpels 2, united at the apex by a common stylar shaft surmounted by the fusiform-capitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate. Follicles 2, apocarpous, terete, dehiscing along the ventral suture, containing numerous dry, rostrate, apically comose seeds (according to Muell.-Arg.).

Type species: *Rhodocalyx rotundifolius* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 173. pl. 51. 1860.

1. *Rhodocalyx rotundifolius* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 173. pl. 51. 1860; Miers, Apoc. So. Am. 138. 1878.

*Echites erecta* A. DC. in DC. Prodr. 8: 469. 1844.

Stems erect, simple, or branched at the base, 2.0–4.5 dm. tall, ferruginous-hirtellous; leaves opposite, shortly petiolate, ovate to suborbicular, apex rounded to very shortly and abruptly acuminate, base broadly obtuse to rounded, the uppermost and the lowermost usually much reduced, 5–9 cm. long, 3.0–9.5 cm. broad, firmly membranaceous, above ferruginous-hispidulous, beneath densely ferruginous-tomentulose; petioles 0.3–0.5 cm. long; inflorescence somewhat surpassing the subtending leaves, bearing 3–18 rather showy flowers; peduncle densely ferruginous-hirtellous; pedicels 1–2 cm. long, ferruginous-hirtellous; bracts very conspicuous and laminate, foliaceous to subpetaloid, oblong to ovate-oblong, about equalling to somewhat surpassing the subtended pedicels; calyx-lobes oblong to ovate-oblong, acute to acuminate, 2.0–2.5 cm. long, the margins ciliolate, otherwise essentially glabrous, rather delicately membranaceous, purplish (according to Muell.-Arg.), the squamellae very deeply lacerate; corolla salverform, glabrous without, the tube 2.0 cm. long, about 0.1 cm. in diameter at the base, the orifice conspicuously annulate, the lobes obliquely obovate, 1.2–1.3 cm. long, somewhat reflexed; stamens inserted somewhat above midway within the corolla-tube, the anthers 0.6 cm. long, essentially glabrous dorsally; ovary ovoid, about 0.1 cm. long, essentially glabrous; stigma 0.15 cm. long; nectaries separate, somewhat shorter than the ovary; follicles unseen.

BRAZIL: MINAS GERAES: data incomplete, *Egnell III* 885 (S, US); *Glaziov* 12951 (US); MATTO GROSSO: campo, Procedencia Cáceres, Sept., 1911, *Hoehne* 4697 (US); DATA INCOMPLETE: *Riedel s.n.* (G, NY).

Also reported from the Brazilian states of São Paulo, Bahia, and Espiritu Santo by Mueller, who describes the color of the corolla as dark crimson to rose-purple.



## EXCLUDED SPECIES

*Rhodocalyx calycosus* (A. Rich.) Miers, Apoc. So. Am. 140. 1878 (*Echites calycosa* A. Rich. in Sagra, Hist. Cuba 11: 94. 1850) = **Asketanthera calycosa** (A. Rich.) Woodson, Ann. Mo. Bot. Gard. 19: 47. 1932.

*Rhodocalyx cinereus* (A. Rich.) Miers, Apoc. So. Am. 141. 1878 (*Echites cinerea* A. Rich. in Sagra, Hist. Cuba 11: 93. 1850) = **Haplophyton cinereum** (A. Rich.) Woodson, comb. nov. Notes on the relegation of this species will be found on p. 231.

*Rhodocalyx coccineus* (Hook. & Arn.) Miers, Apoc. So. Am. 141. 1878 (*Echites coccinea* Hook. & Arn. in Hook. Jour. Bot. 1: 286. 1834) = **Mandevilla coccinea** (Hook. & Arn.) Woodson, Ann. Mo. Bot. Gard. 20: 734. 1933.

*Rhodocalyx crassifolius* (Muell.-Arg.) Miers, Apoc. So. Am. 139. 1878 (*Amblyanthera crassifolia* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 143. 1860) = **Galactophora crassifolia** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 19: 50. 1932.

*Rhodocalyx crassipes* (A. Rich.) Miers, Apoc. So. Am. 140. 1878 (*Echites crassipes* A. Rich. in Sagra, Hist. Cuba 11: 91. 1850) = **Echites umbellata** Jacq. var. **crassipes** (A. Rich.) Gomez, Anal. Soc. Espan. Hist. Nat. 23: 274. 1894.

*Rhodocalyx cuneifolius* Miers, Apoc. So. Am. 142. 1878. Perhaps equivalent to *Mandevilla velutina* (Mart.) Woodson.

*Rhodocalyx hypoleucus* (Benth.) Miers, Apoc. So. Am. 140. 1878 (*Echites hypoleuca* Benth. Pl. Hartw. 23. 1839) = **Macrosiphonia hypoleuca** (Benth.) Muell.-Arg. Linnaea 30: 452. 1860.

*Rhodocalyx lanuginosus* (Mart. & Gal.) Miers, Apoc. So. Am. 139. 1878 (*Echites lanuginosa* Mart. & Gal. Bull. Acad. Roy. Brux. 11<sup>1</sup>: 357. 1844) = **Macrosiphonia lanuginosa** (Mart. & Gal.) Hemsl. Biol. Centr.-Am. Bot. 2: 316. 1882.

*Rhodocalyx ovatus* Miers, Apoc. So. Am. 141. 1878 = **Mandevilla coccinea** (Hook. & Arn.) Woodson, Ann. Mo. Bot. Gard. 20: 734. 1933 (*Echites coccinea* Hook. & Arn. in Hook. Jour. Bot. 1: 286. 1834).

*Rhodocalyx suaveolens* (Mart. & Gal.) Miers, Apoc. So. Am. 139. 1878 (*Echites suaveolens* Mart. & Gal. Bull. Acad. Roy.

Brux. 11<sup>1</sup>: 356. 1844, not A. DC.) = *Macrosiphonia hypoleuca* (Benth.) Muell.-Arg. *Linnaea* 30: 452. 1860 (*Echites hypoleuca* Benth. Pl. Hartw. 23. 1839).

*Rhodocalyx Tweedianus* Miers, Apoc. So. Am. 142. 1878. Probably a species of *Mandevilla*.

#### XXVIII. LAUBERTIA A. DC.

*Laubertia* A. DC. in DC. Prodr. 8: 486. 1844; Benth. & Hook. Gen. Pl. 2: 724. 1876; Miers, Apoc. So. Am. 124. 1878; K. Sch. in Engl. & Prantl, Nat. Pflanzenfam. 4<sup>2</sup>: 170. 1895.

*Streptotrachelus* Greenm. Proc. Am. Acad. 32: 298. 1897.

Lactescent, fruticose or suffruticose lianas. Stems volubile, terete; branches alternate or opposite below. Leaves opposite to occasionally ternate or quaternate, petiolate, entire, penninerved, eglandular; petioles somewhat girdling at the nodes, subtended by numerous minute, pectinate, adaxial, stipular appendages. Inflorescence lateral, alternate, occasionally subterminal or terminal, di- or trichotomously scorpioid, bracteate, bearing few to numerous rather mediocre flowers. Calyx 5-parted, the lobes equal to subequal, slightly foliaceous, cleft nearly to the receptacle, imbricated, eglandular within. Corolla salverform, minutely ferruginous-pubescent without, the tube straight or spirally contorted, exappendiculate within, the orifice conspicuously annulate, the limb actinomorphic, 5-parted, dextrorsely convolute. Stamens 5, the anthers somewhat exserted, connivent and agglutinated to the stigma, consisting of 2 parallel, basally protuberant sporangia borne ventrally near the apex of an enlarged, acutely sagittate connective; pollen granular. Carpels 2, connected at the apex by the common stylar shaft surmounted by the fusiform-capitate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or somewhat conrescent at the base. Follicles 2, apocarpous, terete, dehiscing along the ventral suture, containing many dry, truncate, apically comose seeds.

Type species: *Laubertia Boissierii* A. DC. in DC. Prodr. 8: 487. 1844.

## KEY TO THE SPECIES

- a. Corolla-tube straight, not spirally contorted; species of South America.
  - b. Inflorescence much surpassing the subtending leaves, conspicuously and usually repeatedly compound; calyx-lobes ovate-trigonal. . . . .1. *L. Boissierii*
  - bb. Inflorescence about equalling, or somewhat shorter than the subtending leaves, rather obscurely compound to essentially simple; calyx-lobes oblong-linear. . . . .2. *L. Sanctae-Martae*
- aa. Corolla-tube spirally contorted; species of Mexico and Central America.
  - b. Calyx-lobes ovate-lanceolate, 0.3–0.45 cm. long; corolla-tube 2.0–2.3 cm. long, anther tips exserted. . . . .3. *L. Pringlei*
  - bb. Calyx-lobes narrowly oblong-elliptic, 0.9–1.1 cm. long; corolla-tube 1.3–1.4 cm. long; anthers barely included. . . . .4. *L. peninsularis*

1. *Laubertia Boissierii* A. DC. in DC. Prodr. 8: 487. 1844; Miers, Apoc. So. Am. 124. 1878.

*Echites Eggersii* Mgf. Notizblatt 9: 78. 1924.

Stems relatively stout, finely ferruginous-hirtellous when young, becoming glabrate and conspicuously lenticellate when fully mature; leaves opposite, occasionally ternate or quaternate, petiolate, ovate to oblong-lanceolate, apex acute to acuminate, base broadly obtuse to rounded or obscurely cordate, 4–18 cm. long, 1–9 cm. broad, firmly membranaceous, above minutely hirtellous to glabrate, beneath finely and rather sparsely puberulent when young, eventually glabrate; petioles 1.0–1.5 cm. long, minutely and rather sparsely puberulent to glabrate; inflorescence much surpassing the subtending leaves, scorpioid, the peduncle conspicuously and usually repeatedly compound, bearing relatively numerous, greenish-purple or reddish flowers; pedicels 0.8–1.2 cm. long, finely puberulent-papillate; bracts minutely ovate, scarious to only slightly foliaceous; calyx-lobes ovate-trigonal, sharply acute to acuminate, 2.0–3.5 cm. long, minutely and ferruginously puberulent-papillate without, slightly foliaceous to nearly scarious; corolla salverform, rather indistinctly puberulent-papillate without, the tube 1.5–2.0 cm. long, about 0.25 cm. in diameter at the base, straight, not spirally contorted, the lobes obliquely obovate-dolabriform, 1.0–1.5 cm. long, reflexed; stamens inserted near the orifice of the corolla-tube, the anthers somewhat exserted, 0.6 cm. long, glabrous to minutely puberulent-papillate dorsally; ovary about 0.125 cm. long, glabrous to indefinitely papil-

late; nectaries nearly equalling the ovary; follicles relatively slender, rather obscurely moniliform, 25–40 cm. long, glabrous; seeds 1.0–1.5 cm. long, the pale tawny coma 2.0–2.5 cm. long.

ECUADOR: MANABI: im Wäldern bei El Recreo, April 30, 1897, *Eggers 15684* (B, FM, MBG, NY); DATA INCOMPLETE: *Pavon s.n.* (BB, TYPE, MBG, photograph and analytical drawings).

PERU: SAN MARTIN: on riverside brush, La Merced, alt. 2000 ft., Aug. 10–24, 1923, *Macbride 5473* (FM, US); edge of montaña along trail, Muña, alt. 7000 ft., May 23–June 4, 1923, *Macbride 3902* (FM, US).

**2. *Laubertia Sanctae-Martae* (Rusby) Woodson, Ann. Mo. Bot. Gard. 18: 555. 1931.**

*Echites Sanctae-Martae* Rusby, Descr. So. Am. Pl. 85. 1920.

Stems relatively slender, minutely ferruginous-puberulent when young, becoming glabrate at maturity; leaves opposite, petiolate, elliptic, apex acuminate, base acutely cuneate, 10–15 cm. long, 1.5–4.5 cm. broad, rather delicately membranaceous, minutely and rather sparsely pilosulose to glabrate above, glabrous beneath; petioles 1.0–1.3 cm. long; inflorescence about equalling, or somewhat shorter than the subtending leaves, rather obscurely, and usually only once dichotomous to essentially simple, bearing several greenish-purple or reddish flowers; pedicels 0.8–1.0 cm. long, minutely and rather sparsely puberulent, greatly accrescent in fruit; bracts minutely lanceolate to linear, 0.1–0.3 cm. long, somewhat foliaceous; calyxlobes oblong-linear, acute to acuminate, 0.4–0.6 cm. long, rather conspicuously foliaceous, minutely and ferruginously appressed-puberulent without; corolla salverform, minutely and ferruginously appressed-puberulent without, the tube straight, not spirally contorted, 2.4–2.7 cm. long, about 0.3 cm. in diameter at the base, the lobes obliquely obovate-dolabriform, 0.9–1.1 cm. long, reflexed; stamens inserted at about the upper  $\frac{1}{3}$  of the corolla-tube, the anthers slightly exserted, 0.55–0.6 cm. long, minutely papillate dorsally; ovary ovoid, about 0.15 cm. long, essentially glabrous; nectaries about equalling the ovary; follicles relatively slender, rather distantly moniliform, 40–45 cm. long, glabrous; seeds 1.0–1.3 cm. long, the pale tawny coma 3.0–3.5 cm. long.

COLOMBIA: MAGDALENA: rare in ravines and on wooded hillsides near Valparaiso, alt. 4000–5000 ft., Jan. 20, 1899, *Smith 1643* (MBG, NY, TYPE); data incomplete, *Smith 2525* (MBG, NY).

3. *Laubertia Pringlei* (Greenm.) Woodson, *Ann. Mo. Bot. Gard.* **18**: 555. 1931.

*Streptotrachelus Pringlei* Greenm. *Proc. Am. Acad.* **32**: 298. 1897.

*Prestonia Langlassei* Standl. *Contr. U. S. Nat. Herb.* **23**: 1159. 1924.

Stems relatively stout, minutely hirtellous when young, becoming glabrate at maturity; leaves opposite, petiolate, broadly ovate- to oblong-elliptic, apex shortly acuminate, base rounded to very obscurely cordate, 5–10 cm. long, 2.5–5.0 cm. broad, membranaceous, very minutely and rather sparsely puberulent to essentially glabrate above and beneath; petioles 1.5–3.0 cm. long, minutely and rather sparsely puberulent; inflorescence simple or essentially so, about equalling, or somewhat shorter than the subtending leaves, bearing several greenish-purple flowers; pedicels 1.0–1.5 cm. long, minutely and rather sparsely appressed-puberulent; bracts narrowly lanceolate, 0.1–0.3 cm. long, somewhat foliaceous; calyx-lobes ovate-lanceolate, acuminate, 0.3–0.45 cm. long, minutely hirtellous without, somewhat foliaceous; corolla salverform, minutely ferruginous-puberulent without, the tube spirally contorted at about midway below the insertion of the stamens, 2.0–2.3 cm. long, about 0.3 cm. in diameter at the base, the lobes rather broadly dolabriform, 0.7–0.8 cm. long, reflexed; stamens inserted somewhat above midway within the corolla-tube, the anthers 0.7–0.75 cm. long, minutely hirtellous dorsally, the tips slightly exserted; ovary ovoid, about 0.15 cm. long, minutely hirtellous; nectaries somewhat shorter than the ovary; mature follicles unknown, the immature relatively slender, rather distantly moniliform, finely and ferruginously appressed-hirtellous.

MEXICO: MORELOS: lava beds near Cuernavaca, alt. 5200 ft., Sept. 23, 1896, *Pringle 6554* (G, TYPE, MBG); SINALOA: near Colomar, July, 1897, *Rose 1716* (US).



**4. *Laubertia peninsularis* Woodson, spec. nov.**

Fruticosa volubilis altitudine ignota e fragmento vix facile descripta; ramulis crassiusculis dense ferrugineo-tomentulosis; foliis oppositis petiolatis ovato-ellipticis apice acuminatis basi rotundatis vel obscurissime cordatis 6–13 cm. longis 4–7 cm. latis (fide cl. Schipp) firme membranaceis supra juventate minute puberulis maturitate glabratis subtus minute ferrugineo-puberulis; petiolis 2.0–2.3 cm. longis minute ferrugineo-puberulis; inflorescentiis foliis brevioribus flores mediocres gilvos (fide cl. Schipp) 10–20 gerentibus; pedunculo di- vel trichotomo dense ferrugineo-hirtello; pedicellis congestis 0.8–1.0 cm. longis dense ferrugineo-hirtellis; bracteis anguste lanceolatis 0.2–0.4 cm. longis caducis; calycis laciniis oblongo-ellipticis acutis acuminatisve 0.9–1.1 cm. longis conspicue subfoliaceis extus intusque ferrugineo-hirtellis; corollae salverformis extus minute ferrugineo-hirtellae tubo 1.3–1.4 cm. longo basi ca. 0.25 cm. diametro metiente prope medium paulo contorto lobis oblique obovatis obtusis 0.9–1.1 cm. longis patentibus; antheris 0.5 cm. longis dorso minute puberulo-papillatis apice paulo inclusis; ovario ovoideo ca. 0.15 cm. longo glabro; nectariis ovoideis ovario subaequantibus; folliculis ignotis.

Stems relatively stout, densely ferruginous-tomentulose; leaves opposite, petiolate, ovate-elliptic, apex acuminate, base rounded to very obscurely cordate, 6–13 cm. long, 4–7 cm. broad, firmly membranaceous, above minutely puberulent when young to essentially glabrate at maturity, beneath minutely ferruginous-puberulent; petioles 2.0–2.3 cm. long, minutely ferruginous-puberulent; inflorescence somewhat shorter than the subtending leaves, bearing 10–20 mediocre, cream-colored flowers; peduncle di- or trichotomous, densely ferruginous-hirtellous; pedicels congested toward the upper half of the peduncle, 0.8–1.0 cm. long, ferruginous-hirtellous; bracts narrowly lanceolate, 0.2–0.4 cm. long, caducous; calyx-lobes oblong-elliptic, acute to acuminate, 0.9–1.1 cm. long, conspicuously subfoliaceous, minutely ferruginous-hirtellous within and without; corolla salverform, minutely ferruginous-hirtellous without, the tube 1.3–1.4 cm. long, about 0.25 cm. in di-

anther at the base, spirally contorted at above midway immediately below the insertion of the stamens, the lobes obliquely obovate, obtuse, 0.9–1.1 cm. long, reflexed; stamens inserted at about midway within the corolla-tube, the anthers barely included, 0.5 cm. long, minutely puberulent-papillate dorsally; ovary ovoid, about 0.15 cm. long, essentially glabrous; nectaries ovoid, somewhat shorter than the ovary; follicles unknown.

BRITISH HONDURAS: B. H.-Guatemala Boundary Survey, spring or summer, 1934, Schipp s.n. (MBG, TYPE).

In the spring of 1934, when Schipp accompanied an expedition to determine the boundary between Guatemala and British Honduras, he carried vials containing alcoholic preservative for apocynaceous flowers intended for me. While on this trip Mr. Schipp collected a number of interesting novelties, including the type of *Odontadenia Schippii* Woodson, the only known representative of the genus north of Panama. Unfortunately, however, herbarium specimens of several Apocynaceae were completely spoiled in transit, with the survival only of the alcoholic specimens intended primarily for anatomical studies. Such circumstances befell the collections of *Laubertia peninsularis*. Nevertheless, the preserved specimen was ample to show the plant to be a new species of this poorly understood genus, and a fragment of it is now incorporated in the herbarium of the Missouri Botanical Garden. Mr. Schipp describes his plant as "a tall vine growing in dense forest shade, the leaves of which are about five inches long and two and one-half wide. Flowers cream and slightly perfumed."

#### EXCLUDED SPECIES

*Laubertia* (?) *laxiflora* Rusby, Bull. N. Y. Bot. Gard. 4: 408. 1907 = *Odontadenia laxiflora* (Rusby) Woodson, Ann. Mo. Bot. Gard. 19: 386. 1932.

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#### CORRIGENDA

Page references are to the parenthetical numbers at the bottom of the pages of "Studies in the Apocynaceae. IV." Pages (547)

1-186 are contained in Ann. Mo. Bot. Gard. 20; 187-340 in 22; and 341-563 in 23.

- p. 101. Remove *Echites obovata* Nees from synonymy.
- p. 105. **Mandevilla pulchra** Woodson, nom. nov.  
*Dipladenia glabra* Rusby, Descr. So. Am. Pl. 88. 1920.  
*Mandevilla glabra* (Rusby) Woodson, Ann. Mo. Bot. Gard. 20: 709. 1933, not N. E. Br.
- p. 128. **Mandevilla velutina** (Mart.) Woodson, var. **angustifolia** (Stadelm.) Woodson, comb. nov.  
*Echites Pohliana* Stadelm. var.  $\alpha$  *angustifolia* Stadelm. Flora 24<sup>1</sup>: Beibl. 73. 1841.  
*Dipladenia gentianoides* Muell.-Arg.  $\beta$  *glabra* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 124. pl. 37. fig. 2. 1860.  
*Mandevilla velutina* (Mart.) Woodson, var. *glabra* (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 20: 732. 1933.
- p. 183. **Macrosiphonia petraea** (St. Hil.) K. Sch. var. **minor** (Hook.) Woodson, comb. nov.  
*Echites grandiflora* Desf. var. *minor* Hook. Jour. Bot. 1: 286. 1834.  
*Macrosiphonia verticillata* Muell.-Arg.  $\delta$  *pinifolia* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 141. 1860.  
*Macrosiphonia petraea* (St. Hil.) K. Sch. var. *pinifolia* (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 20: 787. 1933.
- p. 266. In place of *Angadenia Lindeniana* (Muell.-Arg.) Miers read:  
**Angadenia Berterii** (A. DC.) Miers, Apoc. So. Am. 180. 1878 (*Echites Berterii* A. DC. in DC. Prodr. 8: 447. 1844).

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#### ADDENDA

Page references are to the parenthetical numbers at the bottom of the pages of "Studies in the Apocynaceae. IV." Pages 1-186 are contained in Ann. Mo. Bot. Gard. 20; 187-340 in 22; and 341-563 in 23.

## II. MESECHITES Muell.-Arg.

- p. 26. To synonymy of **M. trifida** (Jacq.) Muell.-Arg., add:  
*Echites chlorantha* Schlecht. *Linnaea* 26: 663. 1853;  
 Miers, *Apoc. So. Am.* 196. 1878.
- p. 36. To synonymy of **M. angustifolia** (Poir.) Miers, add:  
*Echites concolor* Ham. *Prodr.* 31. 1825.

## III. MANDEVILLA Lindl.

- p. 99. To synonymy of **M. Martiana** (Stadelm.) Woodson, var.  
**glabra** (Muell.-Arg.) Woodson, add:  
*Micradenia acuminata* (Hook.) Miers, *Apoc. So. Am.*  
 162. 1878.  
 To synonymy of **M. crassinoda** (Gardn.) Woodson, add:  
*Micradenia nodulosa* Miers, *Apoc. So. Am.* 159. 1878.
- p. 120. To synonymy of **M. atrovioleacea** (Stadelm.) Woodson,  
 add:  
*Micradenia atrovioleacea* (Stadelm.) Miers, var. *ovata*  
 Miers, *Apoc. So. Am.* 159. 1878.
- p. 124. To synonymy of **M. illustris** (Vell.) Woodson, var.  
**typica**, add:  
*Echites Gardneriana* A. DC. in DC. *Prodr.* 8: 483.  
 1844.  
*Echites Gardneriana* A. DC.  $\beta$  *grandiflora* A. DC. loc.  
 cit. 1844.
- p. 128. To synonymy of **M. velutina** (Mart.) Woodson, var.  
**angustifolia** (Stadelm.) Woodson, comb. nov., add:  
*Dipladenia longiloba* A. DC. in DC. *Prodr.* 8: 485.  
 1844; Miers, *Apoc. So. Am.* 157. 1878.
- p. 130. To synonymy of **M. coccinea** (Hook. & Arn.) Woodson,  
 add:  
*Dipladenia ? coccinea* (Hook. & Arn.) Muell.-Arg. in  
 Mart. *Fl. Bras.* 6<sup>1</sup>: 132. 1860.
- p. 135. To synonymy of **M. subspicata** (Vahl) Mgf., add:  
*Laseguea latiuscula* Miers, *Apoc. So. Am.* 251. 1878.
- p. 148. To synonymy of **M. scabra** (R. & S.) K. Sch., add:  
*Echites canescens* Willd. ex R. & S. *Syst.* 4: 795. 1819.

- Echites bicolor* Miq. Stirp. Surinam. Select. 154. 1851.  
*Laseguea bicolor* (Miq.) Miers, Apoc. So. Am. 251. 1878.
- p. 152. To synonymy of **M. leptophylla** (A. DC.) K. Sch., add:  
*Amblyanthera leptophylla* (A. DC.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 142. 1860.
- p. 154. To synonymy of **M. Fendleri** (Muell.-Arg.) Woodson, add:  
*Mitozus discolor* Miers, Apoc. So. Am. 224. 1878.  
*Echites discolor* Moritz, ex Miers, loc. cit. nom. nud. in synon.
- p. 173. To the excluded species of *Mandevilla*, add:  
*Mandevilla crassifolia* (Spruce) K. Sch. ex Mgf. in Fedde, Rep. Sp. Nov. 20: 24. 1924, sphalm. = **Galactophora crassifolia** (Muell.-Arg.) Woodson, Ann. Mo. Bot. Gard. 19: 50. 1923 (*Amblyanthera crassifolia* Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 143. 1860).  
*Mandevilla Wrightiana* (Muell.-Arg.) Benth. & Hook. Gen. Pl. 2: 727. 1876 (*Rhabdadenia Wrightiana* Muell.-Arg. Linnaea 30: 438. 1860) = **Neobraccia Valenzuelana** (A. Rich.) Urb. Symb. Ant. 9: 241. 1924 (*Echites Valenzuelana* A. Rich. in Sagra, Hist. Cub. 11: 93. 1850).

To the recognized species of *Mandevilla* add the following:

**Mandevilla Pittieri** Woodson, spec. nov.

Suffrutescens e rhizomate subtuberoso volubilis; ramis gracilibus ca. 4.5–6.0 dm. altis glaberrimis; foliis oppositis petiolatis oblongo-ellipticis apice breviter acuminatis basi late obtusis rotundatisve 7–8 cm. longis 3.0–3.5 cm. latis firmiter membranaceis glaberrimis supra sublutescentibus nervo medio basi pauciglandulifero subtus opacis; petiolis 1.2–1.5 cm. longis glabris; appendicibus stipulaceis minutissimis vix bene visis; racemis simplicibus terminalibus subterminalibusve flores 3–5 gilvos (?) speciosos gerentibus; pedunculo petiolos ca. bis superante glabro; pedicellis 2 cm. longis glaberrimis; bracteis



haud visis; calycis laciniis ovatis acuminatis 0.45–0.5 cm. longis extus minutissime papillatis squamellis multis; corollae infundibuliformis extus omnino glabrae tubo proprio 1.3 cm. longo ca. 0.18 cm. basi diametro metiente faucibus anguste conicis 1.4 cm. longis ostio ca. 0.7 cm. diametro metiente lobis oblique obovatis 1.6–1.7 cm. longis patulis; antheris 0.9 cm. longis glabris; ovario oblongoideo in stylo gradatim angustato ca. 0.3 cm. longo glabro; stigmatе umbraculiforme breviter obtuseque apiculato 0.35 cm. longo; nectariis 2 manifeste inaequalibus ovario multo brevioribus; folliculis ignotis.

Suffrutescent; rhizome subtuberosus; stems relatively slender, glabrous, 4.5–6.0 cm. tall, somewhat twining at the tips; leaves opposite, petiolate, oblong-elliptic, apex shortly (somewhat subcaudate-) acuminate, base broadly obtuse to rounded, 7–8 cm. long, 3.0–3.5 cm. broad, firmly membranaceous, glabrous, somewhat lustrous above, glandular at the base of the midrib, opaque beneath; petioles 1.2–1.5 cm. long, glabrous; stipular appendages extremely minute, scarcely visible; racemes simple, terminal or subterminal, bearing 3–5 showy, creamy white flowers; peduncle about twice surpassing the subtending petioles, glabrous; pedicels 2 cm. long, glabrous; bracts not seen; calyx-lobes ovate, acuminate, 0.45–0.5 cm. long, very minutely papillate without, the squamellae numerous, indefinitely distributed; corolla infundibuliform, glabrous without, the proper tube 1.3 cm. long, about 0.18 cm. in diameter at the base, the throat narrowly conical, 1.4 cm. long, about 0.7 cm. in diameter at the orifice, the lobes obliquely obovate, 1.6–1.7 cm. long, spreading; anthers 0.9 cm. long, glabrous; ovary oblongoid, about 0.3 cm. long, glabrous; stigma umbraculiform, shortly and obtusely apiculate, 0.35 cm. long, nectaries 2, manifestly unequal, much shorter than the ovary; follicles unknown.

COSTA RICA: forêts de Luis, alt. 650 m., Nov., 1897, Pittier 11551 (B, TYPE, MBG, photograph and analytical drawings).

This is the only species of the *Dipladenia* plexus of *Mandevilla* known from north of Colombia. Its most pronounced affinities appear to be with *M. cereola* Woods., of Ecuador and Bolivia, from which it may be distinguished by its foliar glands

at the base of the midrib above, slight tendency to twine, and narrower corolla throat.

***Mandevilla collium* Woodson, spec. nov.**

Fruticosa volubilis altitudine ignota; ramulis gracilibus glaberrimis maturitate bene lenticellatis; foliis oppositis petiolatis obovatis apice brevissime acuminatis basi late obscurissimeque cordatis 5–8 cm. longis 3.0–4.5 cm. latis membranaceis supra nervo medio basi pauciglandulifero ibique molliter puberulo caeterumque glabris glabratissime sub nervo medio basi puberulis caeterumque glabris; petiolis 1–2 cm. longis molliter puberulis; appendicibus stipulaceis interpetiolaribus conspicuis maturitate coriaceis unguiformibus; racemis simplicibus lateralibus; pedunculo ca. 7 cm. longo glaberrimo prope apicem flores gilvos (?) speciosos 5–7 gerente; pedicellis 0.5–0.7 cm. longis glabris; bracteis caducis haud visis; calycis laciniis ovatis longe acuminatis 0.6 cm. longis squamellis multis; corollae infundibuliformis extus glabrae tubo proprio 1.0–1.1 cm. longo ca. 0.2 cm. basi diametro metiente faucibus anguste conicis 2.0–2.2 cm. longis ostio ca. 0.65 cm. diametro metiente lobis oblique obovatis breviter acutis 2.0–2.2 cm. longis patulis; antheris oblongo-sagittatis 0.6 cm. longis glabris; ovariis oblongoideis ca. 0.1 cm. longis glabris; stigmatibus umbraculiforme breviter obtuseque apiculato ca. 0.3 cm. longo; nectariis 2 valde inaequalibus ovarium ca. dimidio aequantibus; folliculis ignotis.

Fruticose lianas; stems relatively slender, glabrous, conspicuously lenticellate when fully mature; leaves opposite, petiolate, obovate, apex very shortly acuminate, base broadly and very obscurely cordate, 5–8 cm. long, 3.0–4.5 cm. broad, membranaceous, above inconspicuously glandular at the base of the midrib, where softly puberulent as well, otherwise glabrous, beneath softly puberulent toward the base of the midrib and otherwise glabrous; petioles 1–2 cm. long, softly puberulent; stipular appendages interpetiolar, conspicuous, coriaceous and unguiform at maturity; racemes simple, lateral; peduncle about 7 cm. long, glabrous, bearing 5–7 creamy-white flowers toward the tip; pedicels 0.5–0.7 cm. long, glabrous;

bracts caducous, not seen; calyx-lobes ovate, narrowly acuminate, 0.6 cm. long, glabrous, squamellae numerous, indefinitely distributed; corolla infundibuliform, glabrous without, the proper tube 1.0–1.1 cm. long, about 0.2 cm. in diameter at the base, the throat narrowly conical, 2.0–2.2 cm. long, about 0.65 cm. in diameter at the orifice, the lobes obliquely obovate, shortly acute, 2.0–2.2 cm. long, spreading; anthers oblong-sagittate, 0.6 cm. long, glabrous; ovary oblongoid, about 0.1 cm. long, glabrous; stigma umbraculiform, shortly and bluntly apiculate, about 0.3 cm. long; nectaries 2, manifestly unequal, about half equalling the ovary; follicles unknown.

BOLIVIA: LA PAZ: Trockenbusch, Conzata, alt. 1300 m., Sept. 20, 1926, *Troll 2687* (B, TYPE, MBG, photograph and analytical drawing).

Closely related to *M. oblongifolia* Woods. and *M. pulchra* Woods., also indigenous to Bolivia, from which it may be distinguished as follows:

- Leaves generally puberulent throughout; corolla throat broadly conical, about 1.5 cm. in diameter at the orifice; squamellae in alternate groups of 4–8  
 ..... *M. oblongifolia*
- Leaves glabrous throughout, or essentially so.
- Leaves inconspicuously puberulent toward the base of the midrib; corolla throat narrowly conical, about 0.65 cm. in diameter at the orifice; squamellae numerous, indefinitely distributed..... *M. collium*
- Leaves glabrous throughout; corolla throat rather narrowly conical, 0.8–1.0 cm. in diameter at the orifice; squamellae in alternate groups of 2–4  
 ..... *M. pulchra*

***Mandevilla Krukovii* Woodson, spec. nov.**

Fruticosa volubilis; ramulis graciliusculis teretibus sparse pilosulis glabratissive; foliis oppositis breviter petiolatis oblongo-oblancoatis apice breviter acuminatis basi obscure auriculatis 8–12 cm. longis 3–4 cm. latis firme membranaceis supra nervo medio sparse pilosulo ibique sparse glandulifero caeterumque glabris subtus sparse ferrugineo-pilosulis; petiolis 0.7–1.0 cm. longis pilosulis; inflorescentiis simplicibus racemosis alterno-lateralibus; pedunculo foliis subaequante minutissime pilosulo; pedicellis 0.2–0.3 cm. longis similiter vestitis; bracteis magnis late ovatis conspicue caudatis 2.0–2.8 cm. longis membranaceis planis petaloideis minutissime puberulis

caducis; calycis laciniis ovato-lanceolatis acuminatis 0.7–0.8 cm. longis minutissime puberulis squamellis oppositis irregulariter erosis; corollae infundibuliformis (colore luteo-aurantiacae ?) extus dense minutissime appresse-puberulae tubo proprio cylindrico 3.2–3.5 cm. longo basi ca. 0.3 cm. diametro metiente faucibus tubulo-conicis 0.9–1.0 cm. longis ostio ca. 0.6 cm. diametro metiente lobis oblique obovatis breviter acuminatis 1.7–1.8 cm. longis patulis; antheris latiuscule oblongo-oblancheolatis apice obtusiusculis basi brevissime auriculatis ca. 0.5 cm. longis glabris; ovario oblongoideo ca. 0.125 cm. longo glabro; stigmatibus umbraculiforme breviter apiculato ca. 0.15 cm. longo; nectariis 5, compresse obovoideis ovario paulo brevioribus; folliculis crassiuculis conspicue moniliformibus 25–28 cm. longis minute puberulis; seminibus 1.2 cm. longis como aurantiaco ca. 2 cm. longo.

Fruticose lianas; branches relatively slender, terete, sparsely pilosulose to glabrate; leaves opposite, shortly petiolate, oblong-oblancheolate, apex shortly acuminate, base obscurely auriculate, 8–12 cm. long, 3–4 cm. broad, firmly membranaceous above, sparsely pilosulose and glandular along the midrib, otherwise essentially glabrous, beneath sparsely and generally ferruginous-pilosulose; petioles 0.7–1.0 cm. long, pilosulose; inflorescence simply racemose, alternate-lateral, bearing 20–25 showy, yellowish-orange (?) flowers; peduncle about equalling the subtending leaves, very minutely pilosulose; pedicels 0.2–0.3 cm. long, minutely pilosulose; bracts showy, petalaceous, membranaceous, broadly ovate, conspicuously caudate, 2.0–2.8 cm. long, very minutely puberulent, caducous; calyx-lobes ovate-lanceolate, acuminate, 0.7–0.8 cm. long, very minutely puberulent, the opposite squamellae irregularly erose; corolla infundibuliform, slightly gibbous, the proper-tube cylindrical, 3.2–3.5 cm. long, about 0.3 cm. in diameter at the base, the throat tubular-conical, 0.9–1.0 cm. long, about 0.6 cm. in diameter at the orifice, the lobes obliquely obovate, shortly acuminate, 1.7–1.8 cm. long, patulous; anthers rather broadly oblong-oblancheolate, apex obtusish, base very shortly auriculate, about 0.5 cm. long, glabrous; ovaries oblongoid, gradually narrowed

to the style, about 0.125 cm. long, glabrous; stigma umbraculiform, shortly apiculate, about 0.15 cm. long; nectaries 5, compressed-obovoid, somewhat shorter than the ovary; follicles rather stout, conspicuously moniliform, 25–28 cm. long, minutely puberulent; seeds 1.2 cm. long, the bright orange coma about 2 cm. long.

BRAZIL: AMAZONAS: Municipality Humayta, near Tres Casas, on low terra firma, Sept. 14–Oct. 11, 1934, *Krukoff 6335* (NY, TYPE, MBG, photograph and analytical drawings).

Perhaps most closely related to *M. hirsuta* (A. Rich.) K. Sch., because of its conspicuously petalaceous bracts, but differing in its narrow corolla-throat and relatively scant indument generally. In shape of foliage and general structure of the corolla *M. Krukovii* displays an affinity with *M. lasiocarpa* (A. DC.) Malme, which, however, has much smaller, lanceolate bracts. Were it not for the fact that *M. hirsuta* has been found to be surprisingly constant throughout a suite of hundreds of specimens representing a majority of extant herbarium specimens, the three species might be suspected as phases of a single, complex entity.

#### V. FORSTERONIA G. F. W. Meyer

- p. 224. To synonymy of **F. leptocarpa** (Hook. & Arn.) A. DC., add:  
*Forsteronia rotundiuscula* Miers, Apoc. So. Am. 248. 1878.
- p. 235. To synonymy of **F. thyrsoides** (Vell.) Muell.-Arg. var. **glabriuscula** (A. DC.) Woodson, add:  
*Forsteronia divaricata* Miers, Apoc. So. Am. 247. 1878.
- p. 252. To synonymy of **F. corymbosa** (Jacq.) G. F. W. Meyer, add:  
*Thyrsanthus pyriformis* Miers, Apoc. So. Am. 100. 1878.
- p. 257. To the list of excluded or doubtful species of *Forsteronia*, add:  
*Forsteronia ovalifolia* (Poir.) Miers, Apoc. So. Am. 248. 1878 (*Echites ovalifolia* Poir. Enycl. Suppl. 2: 535.



1811). Perhaps equivalent to *F. spicata* (Jacq.) G. F. W. Meyer, although the latter is apparently unknown from Hispaniola.

*Forsteronia* ? *linearis* (Vell.) Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 107. 1860 (*Echites linearis* Vell. Fl. Flum. 111. 1830; Icon. 3: pl. 36. 1827). Probably a *Forsteronia* but incapable of exact determination.

#### IX. ODONTADENIA Benth.

- p. 313. To synonymy of *O. verrucosa* (R. & S.) K. Sch., add:  
*Anisolobus rubidulus* Miers, Apoc. So. Am. 173. 1878.
- p. 317. To synonymy of *O. lutea* (Vell.) Mgf., add:  
*Echites densevenulosa* Stadelm. Flora 24<sup>1</sup>: Beibl. 47. 1841.  
*Anisolobus Salzmanni* A. DC. in DC. Prodr. 8: 395. 1844; Muell.-Arg. in Mart. Fl. Bras. 6<sup>1</sup>: 113. 1860; Miers, Apoc. So. Am. 169. 1878.  
*Anisolobus Stadelmeyeri* Muell.-Arg. loc. cit. 113. 1860; Miers loc. cit. 170. 1878.
- p. 320. To synonymy of *O. puncticulosa* (A. Rich.) Pulle, add:  
*Anisolobus distinctus* Miers, Apoc. So. Am. 169. 1878.  
*Anisolobus oblongus* Miers, loc. cit. 1878.

To the recognized species of *Odontadenia* add the following:

#### *Odontadenia caudigera* Woodson, spec. nov.

Fruticosa volubilis; ramulis sat crassiusculis glabriusculis vel minutissime scabridiusculis haud conspicue lenticellatis; foliis oppositis longiuscule petiolatis late ellipticis apice acute breviterque caudato-acuminatis basi late obtusis 14-23 cm. longis 7-11 cm. latis membranaceis opacis glaberrimis; petiolis 2.0-2.5 cm. longis; inflorescentiis lateralibus obscure compositis longe (10-12 cm.) pedunculatis glaberrimis flores 3-6 gilvos speciosos gerentibus; bracteis ovatis 0.2-0.3 cm. longis scariaceis haud caducis; pedicellis ca. 2 cm. longis; calycis laciniis

late ovatis obtusis 0.6–0.7 cm. longis glaberrimis squamellis alternatis 2–3; corollae subinfundibuliformis extus omnino glabrae tubo proprio urceolato 0.8–0.9 cm. longo basi ca. 0.5 cm. diametro metiente faucibus cylindricis 1.6–1.7 cm. longis ostio ca. 0.6 cm. diametro metiente lobis obovato-dolabriformibus rotundatis 2.0–2.1 cm. longis patulis; antheris anguste sagittatis acuminatis 1.2–1.3 cm. longis dorso dense hirtellis; ovario ovoideo ca. 0.2 cm. longo glabro; stigmatibus acute 2-lobatis 0.5 cm. longo; nectariis carnosius profunde multidentatis ovarium paulo superantibus; folliculis ignotis.

Stems relatively stout, glabrous or very minutely scabridulous, not conspicuously lenticellate; leaves opposite, petiolate, broadly elliptic, apex acutely and shortly caudate-acuminate, base broadly obtuse, 14–23 cm. long, 7–11 cm. broad, membranaceous, opaque, glabrous; petioles 2.0–2.5 cm. long; inflorescence lateral, obscurely compound, glabrous, bearing 3–6 showy cream-colored flowers; peduncle 10–12 cm. long; bracts ovate, 0.2–0.3 cm. long, scarious, persistent; calyx-lobes broadly ovate, broadly obtuse, 0.6–0.7 cm. long, glabrous, the squamellae in alternate groups of 2–3; corolla subinfundibuliform, glabrous without, the proper-tube urceolate, 0.8–0.9 cm. long, about 0.5 cm. in diameter at the base, abruptly constricted at the insertion of the stamens, the throat cylindrical, 1.6–1.7 cm. long, about 0.6 cm. in diameter at the orifice, the lobes broadly obovate-dolabriform, rounded, 2.0–2.1 cm. long, patulous; anthers narrowly sagittate, acuminate, 1.2–1.3 cm. long, densely hirtellous dorsally; ovary ovoid, about 0.2 cm. long, glabrous; stigma acutely 2-lobed, 0.5 cm. long; nectaries fleshy, deeply multifid, slightly surpassing the ovary; follicles unknown.

BRITISH HONDURAS: data lacking, *Schipp s.n.* (MBG, TYPE).

It is exasperating that no data accompanied the material of this species, supposedly from the interior of the colony. It is readily distinguished from both *O. Hoffmannseggiana* (Steud.) Woods., known only from Costa Rica and Panama in Central America and northern South America, and the Amazonian

*O. stemmadeniaefolia* Woods. by the narrow corolla-throat which gives it the superficial aspect of a member of § *Nitidae*.

#### XXVI. PRESTONIA R. Br.

The following species, although included in the Key to Species, has been received too late to be incorporated within the revision proper of the genus:

***Prestonia discolor* Woodson, spec. nov.**

Fruticosa volubilis; ramulis crassiusculis glabris; foliis late ellipticis vel late oblongo-ellipticis apice brevissime acuminatis acutisve basi late obtusis 11–21 cm. longis 6–11 cm. latis membranaceis post exsiccationem livide discoloratis opacis omnino glabris; petiolis 1.5–1.8 cm. longis; appendicibus interpetiolaribus sat numerosis late dentiformibus; inflorescentiis corymbosis dichotome divisis flores 30–40 luteo-roseos gerentibus; pedunculo foliis subaequante; pedicellis ca. 1.5 cm. longis glabris; bracteis linearibus ca. 0.08 cm. longis; calycis laciniis elliptico-oblongis acuminatis 1.2–1.3 cm. longis delicate foliaceis glabris squamellis dentiformibus minute erosis vel subintegris; corollae salverformis extus omnino glaberrimae tubo 1.2–1.3 cm. longis basi ca. 0.3 cm. diametro metiente appendicibus epistaminalibus omnino inclusis ca. 0.1 cm. longis faucibus conspicue incrassatis lobis oblique obovatis haud acuminatis 1.4–1.5 cm. longis patentibus; antheris elliptico-sagittatis 0.6 cm. longis dorso distincte pilosulis manifeste exsertis; ovario oblongoideo ca. 0.15 cm. longo glabro; stigmatibus ca. 0.15 cm. longo; nectariis compresse ovoideis basi irregulariter concrecentibus ovarium aequantibus; folliculis ignotis.

Stems relatively stout, glabrous; leaves broadly elliptic to broadly oblong-elliptic, apex very shortly acuminate to acute, base broadly obtuse, 11–21 cm. long, 6–11 cm. broad, membranaceous, lividly discolored in desiccation, opaque, glabrous; petioles 1.5–1.8 cm. long; interpetiolar appendages rather numerous, broadly dentiform; inflorescence corymbous, dichotomously divided, bearing 30–40 yellowish-pink flowers; peduncle about equalling the subtending leaves; pedicels about

1.5 cm. long, glabrous; bracts linear, about 0.08 cm. long; calyx-lobes elliptic-oblong, acuminate, 1.2–1.3 cm. long, delicately foliaceous, glabrous, the squamellae dentiform, minutely erose to subentire; corolla salverform, glabrous without, the tube 1.2–1.3 cm. long, about 0.3 cm. in diameter at the base, the epistaminal appendages wholly included, about 0.1 cm. long, the orifice conspicuously callose-incrassate, the lobes obliquely obovate, not acuminate, 1.4–1.5 cm. long, reflexed; anthers elliptic-sagittate, 0.6 cm. long, distinctly pilosulose dorsally, the tips manifestly exserted; ovary oblongoid, about 0.15 cm. long, glabrous; stigma about 0.15 cm. long; nectaries compressed-ovoid, irregularly conerescent at the base, equalling the ovary; follicles unknown.

BRITISH GUIANA: Mora forest on edge of Karau Creek, Mazaruni River, May 25, 1933, *Tutin 141* (BM, TYPE, MBG, photograph).

Closely related to *P. purpurissata*, but evidently differing specifically in the smaller, greenish calyx-lobes, and shorter corolla-tube with proportionally longer lobes. Mr. Tutin reports that the corolla is yellow and pink, the calyx-lobes green, and the pedicels pale lilac in color.

To the American genera of Echitoideae add the following:

#### XXIX. TINTINNABULARIA Woodson

**Tintinnabularia** Woodson, gen. nov. Apocynacearum (Echitoideae).

Calyx majusculus profunde 5-partitus; laciniae foliaceae subaequales margine imbricatae intus basi in marginibus pauciglanduligeræ. Corolla speciosissima magna infundibuliformis; tubus inferne latiuscule cylindricus dein late dilatatus ibique staminiger; limbi laciniae 5 aequales oblique obovatae aestivatione dextrorsum convolutae. Stamina 5 omnino inclusa; antherae inter se adglutinatae et stigmati adplicatae oblongo-sagittatae apice longe caudatae ibique plus minusve convolutae basi obtuse 2-auriculatae dimidia parte superiore ventro pollinigeræ, sporangia uniforme fertilia pollinibus

granulosis; filamenta filiformia antheris conspicue longiora haud adglutinata. Ovarii carpella gemina basi distincta apice in stylo gracili producta ovulis multis in quoque loculo pluri-seriatim positis; stigma capitato-fusifforme apice obscure obtuseque 2-partitum basi 5-maniculatum. Nectarium glandulae 5 saepissime separatae vel inter se plus minusve adglutinatae. Fructus ignotus ut creditur folliculus apocarpus. Frutices volubiles; folia opposita petiolata membranacea supra nervo medio inconspicue glandulifero subtus in axillis nervi medii inconspicue foveata. Inflorescentia lateralis alternata corymboso-trichasialis pluriflora bracteis foliaceis oppositis.

Lactescent (?), fruticose lianas. Stems volubile, terete; branches alternate above. Leaves opposite, membranaceous, the ventral surface bearing rather few, inconspicuous glandular emergences indefinitely clustered at the base of the midrib, the dorsal surface bearing rather inconstantly inconspicuous elliptic foveae in the axils of the midrib; petioles somewhat girdling at the node into a slightly dilated, minutely appendiculate, stipular ring. Inflorescence lateral, alternate, corymbose-trichasial, pluriflorous, the pedicels subtended by solitary, foliaceous bracts. Calyx 5-parted, the lobes subequal, foliaceous, cleft nearly to the receptacle, imbricated, bearing within small groups of alternate, glandular squamellae. Corolla infundibuliform, the tube straight, rather broadly cylindrical below, dilated into a broad throat at the insertion of the stamens, the limb 5-parted, actinomorphic, dextrorsely convolute. Stamens 5, inserted at the base of the corolla-throat, included; anthers connivent and agglutinated to the stigma, consisting of 2 parallel, uniformly fertile sporangia borne ventrally near the apex of an enlarged, caudate, obtusely 2-auriculate connective; pollen granular; filaments very conspicuously longer than the anthers, filiform. Carpels 2, united at the apex by an elongate stylar shaft surmounted by the fusiform-capitate, obtusely 2-lobed, basally 5-maniculate stigma; ovules many, several-seriate, borne upon an axile, binate placenta. Nectaries 5, separate or somewhat irregularly connate. Fruit unknown, supposedly follicular, apocarpous.



**Tintinnabularia Mortonii** Woodson, spec. nov.*Plate 7.*

Fruticosa volubilis altitudine ignota; ramulis teretibus vel leviter compressis glabris maturitate inconspicue lenticellatis; foliis oppositis petiolatis oblongo-ellipticis apice obtuse caudato-acuminatis basi obtusis 9–10 cm. longis 3.0–3.5 cm. latis firme membranaceis omnino glabris supra nervo medio basi inconspicue glanduligeris subtus in axillis nervi medii inconspicue irregulariterque foveolatis; petiolis 0.7–1.0 cm. longis glabris; inflorescentiis corymboso-trichasialibus alterno-lateralibus folia ca. bis superantibus flores speciosos albos ca. 9 gerentibus; pedunculo 4.0–5.5 cm. longo glabro; bracteis foliaceis ovato-lanceolatis acuminatis 1–2 cm. longis; pedicellis 2 cm. longis glabris; calycis laciniis oblongo-ellipticis acuminatis foliaceis 1.2–1.3 cm. longis glabriusculis intus basi squamellas 2–4 minutas alternatas gerentibus; corollae infundibuliformis tubo proprio latiuscule cylindrico 0.7–0.9 cm. longo basi ca. 0.3 cm. diametro metiente extus puberulo-papillato intus prope insertionem staminum dense villosulo faucibus tubularibus 3.0–3.5 cm. longis ostio ca. 0.8 cm. diametro metiente extus intusque dense puberulo-papillatis lobis oblique obovatis obtusiusculis 0.9–1.0 cm. longis extus puberulo-papillatis intus minute denseque puberulis paululo patulis; staminum antheris oblongo-sagittatis caudiculatis basi obtuse 2-auriculatis 1.3 cm. longis caudiculis minute pilosulis inter se convolutis filamentis filiformibus 3.5 cm. longis basi minute pilosulis; ovariis oblongoideis ca. 0.35 cm. longis glabris; stigmate subcapitato basi 5-manicato ca. 0.3 cm. longo; nectariis compressis ovoideis ovario subaequantibus; folliculis ignotis.

Frutescent lianas of unknown height; branches terete or slightly compressed, glabrous, inconspicuously lenticellate at maturity; leaves opposite, petiolate, oblong-elliptic, apex obtusely caudate-acuminate, base obtuse, 9–10 cm. long, 3.0–3.5 cm. broad, firmly membranaceous, glabrous throughout, upper surface bearing relatively few, inconspicuous glands at the base of the midrib, lower surface bearing with relative in-

constancy solitary elliptic foveae in the axils of the midrib; petioles 0.7–1.0 cm. long, glabrous; inflorescence alternate-lateral, corymbose-trichasial, about twice surpassing the length of the subtending leaves, bearing about 9 showy, cream-colored flowers; peduncles 4.0–5.5 cm. long, glabrous; pedicels 2 cm. long, glabrous; bracts foliaceous, ovate-lanceolate, acuminate, 1–2 cm. long; calyx-lobes oblong-elliptic, acuminate, 1.2–1.3 cm. long, foliaceous, essentially glabrous, the squamellae in alternate groups of 2–4; corolla infundibuliform, the proper-tube rather broadly cylindrical, 0.7–0.9 cm. long, about 0.3 cm. in diameter at the base, puberulent-papillate without, densely villosulose toward the insertion of the stamens within, the throat tubular, 3.0–3.5 cm. long, about 0.8 cm. in diameter at the orifice, densely puberulent-papillate within and without, the lobes obliquely obovate, obtusish, 0.9–1.0 cm. long, somewhat patulous, puberulent-papillate without, minutely and densely puberulent within; anthers oblong-sagittate, caudate, obtusely 2-auriculate at the base, 1.3 cm. long, the convolute apical appendages minutely pilosulose, otherwise glabrous, the filaments filiform, 3.5 cm long, minutely pilosulose toward the base; ovaries oblongoid, rather gradually produced into the style, about 0.35 cm. long, glabrous; stigma subcapitate, basally 5-maniculate, about 0.3 cm. long; nectaries compressed-ovoid, somewhat shorter than the ovary; follicles unknown.

GUATEMALA: ALTA VERAPAZ: quebradas secas, at 2000 ft. alt., in jungle, June 8, 1920, Johnson 200 (US, TYPE, MBG, photograph and analytical drawings).

The Key to Genera (p. 20) may be amplified to include *Tintinnabularia* as follows (under A.):

B. Inflorescence bostrychoid, di- or trichotomously compound.

C. Corolla infundibuliform.

D. Calyx-lobes conspicuously foliaceous; staminal filaments filiform, conspicuously longer than the anthers; leaves foveate in the axils of the midrib beneath.....XXIX. TINTINNABULARIA

DD. Calyx-lobes scarious or only slightly foliaceous; staminal filaments shortly cylindrical, shorter than the anthers; leaves not foveate beneath.....I. ALLOMARKGRAFIA

*Tintinnabularia* is of great interest because of its obvious affinity with the Asiatic genus *Beaumontia*, a widely cultivated

liana bearing large, infundibuliform corollas with conspicuously foliaceous calyx-lobes, filiform staminal filaments much longer than the anthers, an anomaly in the Apocynaceae, and leaves which are foveate in the axils of the midrib. *Tintinnabularia* differs from *Beaumontia*, however, in the somewhat smaller corollas with tubular throat and shorter lobes, anthers with convolute apical appendages, carpels which are not united save when immersed within the receptacle, maniculate stigmata, and leaves which are glandular at the base of the midrib. Although the fruit of *Tintinnabularia* is not yet known, it is doubtful that it agrees with that of *Beaumontia* which is essentially syncarpous until the dehiscence of the valves.

The specific adjective commemorates Mr. C. V. Morton, who called to my attention the type specimen which had been laid amongst the undetermined exsiccatae of the United States National Herbarium.

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*Italicised numerals refer to collectors' numbers, s.n. (sine numero) to unnumbered collections; parenthetical numerals refer to the numerals of taxonomic entities conserved in this revision—the Roman to genera, and the Arabic to species. Varieties are undesignated. Genera Nos. I–IV are contained in Ann. Mo. Bot. Gard. 20: 605–790. (1)–(186). 1933; Nos. V–IX, in 22: 153–306. (187)–(340). 1935; Nos. X–XXIX, in 23: 169–391. (341)–(563). 1936.*

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- Duss, P. 2841, 3713 (XXVI 7).
- Dutra, —. 301 (XIII 1).
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- Eastwood, A. s.n. (XIX 1).
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- Eggers, H. s.n. (III 81); 438 (V 45); 836 (XVII 1); 1155 (III 96); 1638 (II 7); 1639 (II 8); 1686 (XV 2); 1721 (II 7); 1894, 1894b, 1894c (V 46); 3389 (II 7); 4315 (XV 2); 4707 (XXIII 1); 5297 (XV 1); 5347 (V 41); 5482 (III 81); 5546 (III 96); 5568 (XXVI 14); 13166 (III 81); 14527 (XXVI 40); 14722 (XXVI 60); 14782, 14956 (XXVI 18); 15078 (XXVI 27); 15430, 15430bis (XXVI 16); 15618 (V 26); 15684 (XXVIII 1).
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- Lorentz, P. G. & G. Hieronymus. *s.n.* (III 41); 216, 358 (V 23); 403 (III 41).
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- Luetzelburg, P. *s.n.* (III 43; XXVI 47); 383 (III 30); 5000 (III 74); 6953 (III 70); 7155 (III 44); 12599 (III 30).
- Lund, P. W. *s.n.* (III 25, 74, 76; IV 6, 8, 9; XXVI 17); 886 (IV 10).
- Lundell, C. L. *s.n.* (III 81); 515 (XX 6); 842, 1524 (XVI 2); 1350 (XX 4); 2540 (V 32); 3445, 3533, 4046, 4056, 4736 (XVI 2).
- Luschnath, B. *s.n.* (V 3, 34).
- Macbride, J. F. 2777 (II 1); 2785 (XXVI 14); 3730 (III 38); 3902 (XXVIII 1); 4720 (III 81); 5245 (XXVI 8); 5473 (XXVIII 1); 5812 (III 93).
- Mac Nab, G. *s.n.* (VI 6).
- Malme, G. A. *s.n.* (II 5; III 84; IX 9; XXVI 12); 248, 364 (V 30); 502 (XXVI 2); 602 (V 30); 690 (XIII 1); 827 (XXVI 2); 1038 (V 23); 1058 (II 3); 1118 (VI 1); 1196 (III 84, 96); 1276B (XXVI 47); 1478 (XXVI 8); 1536 (IX 9); 1642 (IX 22); 1766 (IX 21); 2036 (IX 11); 2489 (V 23); 3122 (XXVI 8); 3305 (IX 22).
- Mandon, G. 1472 (III 40).
- Manso, A. da S. *s.n.* (VI 1); 2 (III 86); 398 (III 74).
- Manso, A. da S. & J. Lhotzky. 29 (III 96); 33 (XXVI 12); 34 (II 5); 37 (XXVI 8).
- Martin, J. *s.n.* (III 78; V 12; VIII 10; IX 19; XXIII 3).
- Martius, P. von. *s.n.* (III 30, 72, 74; V 8, 22, 23; VI 4; IX 1, 12, 22; XXIV 1; XXVI 8); 105 (VIII 6); 133 (V 22); 292 (III 74); 293, 299 (III 72); 300 (III 46); 307 (III 71); 324 (VIII 7); 503 (III 74); 504 (III 76); 506 (III 69); 909 (III 46); 966 (VIII 7); 967 (VI 1); 1034 (IX 17); 2267 (III 30); 2663 (IX 5); 2960 (V 7); 3029 (XXVI 29).
- Matthews, A. *s.n.* (XXVI 18); 820 (III 23); 1327, 1977 (III 81); 1978 (III 22).
- Maxon, W. R. & A. D. Harvey. 6507 (II 1); 6527 (III 96).
- Maxon, W. R., A. D. Harvey & A. T. Valentine. 7614 (XX 3).
- Maxon, W. R. & E. P. Killip. 394 (XV 1); 1440 (XVI 1); 1615 (XX 6); 1675 (III 9).
- Maxon, W. R. & A. T. Valentine. 6972 (III 96).
- Mayerhoff, C. J. 28 (II 7).
- Mc Clatchie, A. J. *s.n.* (XIX 1).
- Mc Rae —. *s.n.* (VIII 7).
- Mearns, E. A. 1755 (IV 2); 1884 (IV 2).
- Melinon, —. *s.n.* (VIII 10); 460 (V 12).
- Mellichamp, J. H. *s.n.* (VII 1).
- Mendonça, R. 506 (IV 9).
- Mexia, Y. 5234 (V 47); 5334A (VI 4); 5337 (XXVI 4); 5914 (V 47); 5994 (VIII 5).
- Miers, J. 98 (III 96); 2418 (III 30); 3436 (III 43); 4020 (XXI 2); 4022 (III 96); 4027 (VIII 7); 4029 (III 43); 4031 (III 96); 4049 (V 8).
- Mikan, J. C. *s.n.* (III 49; VIII 7; XIII 4; XXVI 2).
- Millsapaugh, C. F. 1102, 1113 (II 9).

- Mohr, C. *s.n.* (VII 1).  
 Mohr, C. & —. Sudworth. *s.n.* (VII 1).  
 Moldenke, H. N. 725 (XVII 1); 399A (XV 2); 1006A, 5784 (XVI 1).  
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 Morong, T. 380 (II 3); 420 (IV 10); 420A (IV 8); 810 (V 23); 895 (II 3).  
 Morton, C. V. & —. Makrinus. 2348 (XXVI 44).  
 Mosén, H. 622 (XIII 4); 947 (III 68); 1461 (XXVI 48); 3020 (XXI 2); 3193 (III 43); 3433 (XXVI 3); 3434 (V 27); 4269 (XXVI 2); 4271 (V 34).  
 Moss, A. M. *s.n.* (III 96).  
 Munies, F. 94 (IV 7); 5586 (V 30).  
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 Mutis, J. C. *s.n.* (III 26, 28); 97 (III 85).  
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 Nash, G. V. & N. Taylor. 898 (XVI 1); 1309, 1385 (II 7); 1633, 3773 (XVI 1); 3890 (XX 6).  
 Nelson, E. W. 809, 866 (III 81); 3080 (XX 1); 3337 (III 2); 4658 (III 11); 4659 (IV 3); 4692 (IV 5).  
 Netto, L. do S. M. *s.n.* (III 69); 46 (VI 1).  
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 Novaes, J. C. 384 (V 35); 11202 (XXVI 4); 11207 (XXVI 59).  
 Nurse, H. A. 2158 (III 81).  
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 Ørsted, A. S. 15510 (III 37); 15542 (II 1); 15544 (XX 1).  
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 Palmer, W. & J. H. Riley. 207, 337 (XV 2); 348 (II 9); 364, 833 (XVI 1); 842 (XX 6); 871 (II 9); 1010 (XVI 1); 1041 (XX 6).  
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 Pearce, R. *s.n.* (III 23); 708 (III 60).  
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 Pennell, F. W. 1330, 1390 (III 81); 1525 (II 1); 1633 (III 81); 2034 (III 27); 2726, 2817 (III 85); 3438 (II 6); 3442 (III 85); 3911 (II 2); 3912 (XXVI 8); 3956 (XVII 3); 4155, 4181, 4617 (II 1); 5405 (III 91); 5604 (III 95); 5719 (XXVI 22); 10231, 10703, 10783, 10820 (III 91); 10884 (II 1, 6); 12002 (II 1).  
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- Perkins, J. R. 276 (III 9); 1100, 1378 (V 43).
- Perrottet, S. s.n. (II 1; III 78; VIII 10); 270 (IX 12); 272 (III 96).
- Persaud, —. 74 (III 88).
- Picarda, L. 154 (V 46); 804 (XXIII 2); 813 (V 46).
- Pickel, D. B. 1222 (V 27).
- Pilger, R. 643 (IV 6); 670 (III 96); 799 (VI 1).
- Piper, C. V. 5850 (II 1); 5914 (III 96).
- Pittier, H. s.n. (III 96); 144 (III 3); 203 (III 96); 304 (III 81); 343 (III 96); 369 (III 37); 471 (II 1); 520 (III 93); 555 (III 96); 611 (III 95); 810 (III 81); 2498 (III 96); 2813 (VIII 20); 3147 (III 37); 3736 (III 82); 3752 (VIII 20); 3767 (XXVI 37); 3976 (IX 19); 4002 (III 96); 4329 (IX 1); 4417 (II 1); 4700 (XXVI 49); 4756 (III 86); 4941 (II 1); 5125 (XIII 5); 5460, 5490 (III 96); 6047 (XXVI 14); 6652 (XXVI 57); 6869 (II 1); 7300 (III 81); 7598 (III 82); 7638 (II 1); 8108 (III 61); 8540 (III 96); 8832 (XXVI 52); 8918 (V 4); 8920 (XIII 3); 9650 (III 81); 9730 (II 1); 9881 (IX 19); 9935 (XXVI 44); 10127 (III 98); 10760, 11212 (II 1); 11228, 11278 (III 81); 11551 (Addenda); 11597 (III 81); 12037 (II 1); 12401 (XXVI 44); 12556 (III 61); 12558 (III 81); 12759 (II 1); 12778 (III 81); 13121 (II 1); 13412 (XXVI 14); 13436 (III 96); 16016 (XXVI 44); 16137 (VIII 20); 16622 (V 32).
- Poeppig, E. 33 (II 4); 144 (III 81); 537 (XV 2); 1233 (III 81); 1582 (VI 2); 1840 (III 83); 2161 (XXVI 30); 2547 (VIII 10); 2657 (IX 10); 2946 (XVII 1).
- Pohl, J. E. s.n. (III 21, 30, 58, 72, 74, 76; IV 9; V 27; VI 1; XXVI 47); 15 (III 43); 895 (IV 10); 970 (IV 6); 1383 (IX 9); 1592 (XIV 1); 1845 (VI 1); 1846 (VI 4); 1898 (IX 22); 1899 (IX 9); 2139 (V 23); 2214 (XXVI 47); 2452 (XXVI 2); 5167 (XXVI 50); 5168, 5397 (XXVI 2).
- Poitau, A. s.n. (II 1, 8; III 96; V 12).
- Pollard, C. L., E. Palmer, & W. Palmer. 2, 248 (II 9).
- Pollard, R. M. 40 (III 86).
- Porto, —. 7931 (IV 9); 8671 (VIII 7).
- Preuss, P. 1462 (III 96); 1617 (XXVI 47).
- Pride, —. s.n. (III 55).
- le Prieur, F. R. s.n. (III 78, 86, 96); 241 (III 78); 244 (III 96).
- Pringle, C. G. s.n. (III 8); 320 (IV 3); 690 (III 11); 694 (IV 5); 701 (III 11); 1108, 4393 (IV 3); 4662 (III 32); 4822 (XXV 3); 5422 (III 7); 6224 (XXVI 55); 6329 (III 7); 6341 (XXVI 55); 6554 (XXVIII 3); 6966, 7242 (XXV 2); 11014 (IV 3); 11015 (III 11); 11357 (III 13); 11838 (IV 4); 13106 (III 8); 13585 (XXV 4); 13760 (III 32); 13890 (III 8).
- Pulle, A. A. 78 (III 86); 291, 453 (V 12); 493 (III 78).
- Purdie, W. s.n. (II 1; III 9, 26, 81).
- Purpus, C. A. 851 (XIX 1); 1378 (IV 4); 1392 (III 10); 1935 (III 1); 2215 (III 81); 3989 (IV 4); 4613 (III 10); 5055, 5206 (IV 4); 5213 (III 10); 5408 (XXII 1); 5906 (III 81); 6232 (XXII 1); 6929 (III 82); 7274 (III 6); 7281 (III 81); 7665 (XXVI 55); 10347 (V 41); 10739 (III 81); 10790 (III 1); 10885 (III 81); 11134 (XXVI 55).
- Queleh, J. J. & F. N. McConnell. 132 (III 89); 146 (III 94); 194 (III 89).
- Raben, (Graf) F. C. s.n. (III 74).
- Raimondi, A. 8228 (XXVI 51).
- Ravenel, H. W. s.n. (VII 1).
- Record, S. J. s.n. (III 81).
- Regel, —. s.n. (V 24; VIII 6; XXVI 35).

- Begnall, A. F. *II* 186 (III 25); 189 (III 96; IV 10); 280 (III 72); 287 (III 74); *II* 358 (XXVI 2); *III* 850 (IX 9); *II* 873 (III 30); 874 (III 77); 875 (III 68, 76); *III* 877 (V 35); 878 (IV 9); *III* 880 (IX 9); 881 (II 5); *III* 882 (V 30); *III* 883 (XIII 4); *III* 884 (XXVI 59); *III* 885 (XXVII 1); 1462 (III 86); *III* 1600 (XXVI 48).
- Reiche, C. s.n. (III 11).
- Reineck, E. M. 467 (V 30).
- Reineck, E. M. & J. Czermak. 467 (V 27).
- Reko, B. P. 3411 (III 81); 3611 (XXII 1); 3955 (III 32); 4323 (XXV 1); 5166 (III 11); 5212 (IV 4).
- Reverchon, J. 1378 (IV 5); 2558 (VII 1).
- Revirosa, J. N. 126, 225 (III 81).
- Reynolds, H. S. s.n. (VII 1).
- Richard, —. s.n. (VIII 11).
- Ricketts, —. s.n. (IV 2).
- Ridley, H. N., T. S. Lea & G. Ramage. s.n. (III 96).
- Riedel, L. s.n. (II 5; III 21, 30, 58, 72, 74, 76, 96; IV 8, 10; V 8, 22, 27, 34; VI 1; VIII 6, 7; XIII 4; XXVI 2; XXVII 1); 60, 61 (III 43).
- Rimbach, A. 22 (II 1).
- Ritter, —. s.n. (XVII 1).
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- Roig, J. T. 109 (X 1); 3227 (X 2).
- Rojas, T. 2 (II 3); 2654 (IV 8); 9698 (V 23); 9768A (XXVI 59); 9838 (XIII 2); 10270 (XXVI 8); 10652 (V 47).
- Rose, J. N. 1716 (XXVIII 3); 1983, 3474 (IV 3); 16700 (IV 1).
- Rose, J. N., W. R. Fitch & P. G. Russell. 4292 (XX 6).
- Rose, J. N. & R. Hay. 6292 (IV 3).
- Rose, J. N. & —. Hough. 4752 (IV 3).
- Rose, J. N., —. Pachano & J. S. Rose. 23029 (III 35).
- Rose, J. N., J. H. Painter & J. S. Rose. 9055, 9129 (III 10); 9510 (III 11).
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- Rothrock, J. T. 146, 369 (III 9); 497, 646 (IV 2).
- Rothschub, E. 614 (III 81).
- Rudolph, B. s.n. (III 86).
- Rugel, F. s.n. (VII 1); 114 (XVII 1); 343 (V 46); 397 (XXIII 1).
- Rusby, H. H. 2379, 2380 (III 79); 2385 (III 23, 90); 2386 (III 40); 2387 (III 96); 2392 (VI 1); 2393 (II 4); 2394 (III 39, 73); 2526 (V 23); 2694 (III 73).
- Rusby, H. H. & F. W. Pennell. 121 (XXVI 15); 404, 1032 (III 85).
- Rusby, H. H. & R. W. Squires. 20 (XVII 3); 293 (III 78); 302 (XXVI 8).
- Ruth, A. 482 (VII 1).
- Saer, —. s.n. (III 81).
- Sagot, P. A. 381 (III 96); 382 (III 78); 383 (IX 19); 386 (III 86); 387 (XVII 1); 392 (VIII 10); 886 (III 88); 1067 (V 12); 1143 (VIII 10).
- de la Sagra, R. s.n. (XV 2; XVII 1); 120 (II 9).
- St. Hilaire, A. de. 2597 (IV 8).
- Salazar, A. E. s.n. (III 11).
- Salzmann, P. 313 (III 43); 320 (III 86).
- Sampaio, A. J. de. 238 (III 96).
- Samuels, J. A. 439 (V 9); 457 (III 88).
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- Sartorius, K. s.n. (III 81).
- Schaffner, W. 489 (IV 3).
- Schenck, H. 1875 (V 27); 1947 (XXVI 35); 2269 (V 27).
- Schiede, C. J. W. 167 (III 81); 448 (III 11); 488 (XXVI 55); 493 (III 11).
- Schipp, W. A. s.n. (XXVIII 4; Adenda); 56 (III 96); 148 (XVII 1); 360 (V 11); 368 (III 81); 376 (XVII 1); 491 (XVI 2); 963 (VIII 20);



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- Schlim, L. J. 510 (VI 3).
- Schomburgk, Rich. 200 (IX 21); 854 (V 15); 1438 (V 38); 1514 (V 9).
- Schomburgk, Robt. H. s.n. (XI 3); 22 (II 7); 37 (V 9); 39 (VIII 10, 16); 130 (III 96); 183 (III 103); 309 (IX 19); 311 (II 1); 329 (XVII 2); 350 (III 87); 374 (XXVI 47); 383 (III 89); 421 (VI 1); 557 (V 9); 599 (VI 1); 608 (V 1); 665, 681 (VI 1); 707 (V 38); 715 (XXVI 9); 725 (V 15); 755 (XXVI 47); 782 (V 9); 788 (VIII 10); 800 (VIII 10); 821 (V 12); 830 (VIII 3); 951 (VIII 10); 953 (V 1, 18); 1378 (VIII 10); 1386 (VIII 3); 1446 (V 12); 1551 (XI 2); 1953 (III 106).
- Schornbaum, —. s.n. (V 27).
- Schott, A. 673 (III 9).
- Schott, H. W. s.n. (VIII 7); 5389 (XXVI 19); 5398 (XIII 4); 5404 (III 43); 5976 (V 3).
- Schüch, C. G. de. s.n. (XXVI 4).
- Schultze, A. 193 (III 85); 245 (XXVI 15); 474 (XXVI 26); 605 (XXVI 49).
- Schunke, C. 389, 391 (III 79).
- Schwacke, W. 8754, 11854 (V 35).
- Seemann, O. 95 (III 82); 156, 161 (II 1); 1220 (III 37).
- Seitz, A. 14 (III 96).
- Seler, C. & E. Seler. 39 (III 32).
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- Selwyn, —. 30 (III 100).
- Setchell, W. A. & C. C. Dobie. s.n. (XIX 1).
- Shafer, J. A. 13 (X 1); 297 (XVI 1); 302 (XX 6); 493, 941 (II 9); 1236 (XX 6); 1231 (X 1); 1447 (V 46); 1500 (II 9); 1624 (XVI 1); 2446 (II 9); 2590 (XX 6); 2737 (XVI 1); 2748 (XVI 1); 2872 (V 46); 2928 (II 10); 2951 (XX 6); 2955 (II 10); 3106 (X 1); 7970 (XX 6); 8268 (X 1); 10370 (XX 6); 10383 (II 9); 10428 (XV 2); 11861 (II 9); 11966 (X 1); 12167, 13419 (XX 6).
- Shannon, R. C. & E. S. Shannon. 28 (XVIII 1).
- Shannon, W. C. 218, 251 (III 82).
- Shattuck, O. 129 (XXVI 37).
- Shaw, —. s.n. (III 72).
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- Small, J. K. 3995, 8786 (XVI 1).
- Small, J. K. & J. J. Carter. 2654 (XVI 1); 2655, 2657 (XX 6); 3116, 8605 (XVI 1); 8751 (X 3).
- Small, J. K., J. J. Carter & G. K. Small. 3545 (XX 6).
- Small, J. K., C. A. Mosier & G. K. Small. 6582 (XX 6).
- Small, J. K. & G. V. Nash. s.n. (XX 6).
- Small, J. K. & P. Wilson. 1756 (XVI 1).
- Smith, A. L. 672 (III 12).
- Smith, C. L. 71 (III 96).
- Smith, H. H. 165 (XXVI 47); 884 (V 41); 1640 (II 2); 1641, 1642 (II 1); 1643 (XXVIII 2); 1644 (XXVI 14); 1645 (XXVI 8); 1647 (XXVI 26); 1656 (XXVI 53); 1662 (III 81);

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- Smith, J. D. 1746 (III 96); 4884, 6657 (III 96).
- Smith, L. B. 1529 (III 67); 2037 (XXI 2).
- Smith, L. C. 257, 468 (III 33); 660 (III 81); 661 (XXVI 55); 691 (III 81).
- Smethlage, E. H. 328 (II 1).
- Sodiho, A. s.n. (XXVI 18); 10613, 10616 (III 17); 106/1 (XXVI 27); 107/16 (XXIV 2).
- Splitgerber, —. s.n. (III 96).
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- Stahel, —. & —. Gonggrijp. 2862 (IX 23); 6624 (V 12).
- Stahl, A. 743 (V 45).
- Standley, P. C. 22349 (XXVI 44); 23542 (XXII 1); 23673 (XXVI 58); 24512 (III 81); 25027 (III 96); 27717, 27936 (II 1); 28636 (VIII 20); 29251 (II 1); 30184 (VIII 20); 30290 (II 1); 30385 (III 96); 30562, 31810 (II 1); 41332 (XXVI 57); 53619 (II 1); 54737 (VIII 20); 56365, 56470 (III 81).
- Steele, W. C. 1471 (XX 4); 1477 (XX 5); 1918 (XVI 2); 1987 (XX 6).
- Steinbach, J. 2363 (XXVI 28); 3113 (VI 1); 3256, 3331 (XXVI 8); 3772, 6065 (XXVI 59); 6717 (V 20); 6813 (XXIV 1); 7272 (XXVI 24); 7295 (V 23); 7301 (VI 1); 7376 (XXVI 28); 7456 (II 5); 7577 (III 96); 7732 (V 23); 8020 (V 20); 8662 (III 40); 9090 (III 23).
- Stephan, —. s.n. (III 76, 96).
- Stevens, E. P. s.n. (III 96).
- Stevens, F. L. 538 (III 81); 1006 (III 82).
- Stewart, J. T. s.n. (VII 1).
- Stork, —. 270 (III 96).
- Stuekert, T. s.n. (IV 8).
- Stuebel, A. 56 (III 53); 74 (III 85).
- Sutcliffe, E. C. s.n. (XIX 1).
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- Tafalla, —. s.n. (I 1).
- Talbot, H. F. s.n. (III 78).
- Tamberlik, —. s.n. (II 5; III 87).
- Tate, G. H. H. 188 (III 103); 228 (III 89); 235 (III 96); 669 (III 60); 805 (XII 2); 836 (XII 1).
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- Tharp, B. C. 3646, 4648 (IV 5).
- Thieme, C. 517, 622, 5346, 5347 (III 81).
- Thompson, W. J. 1005 (XVI 1); 7975 (III 9).
- Thurber, G. 764 (IV 2).
- im Thurn, E. F. s.n. (II 1; III 96, 106).
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| <i>suaveolens</i> .....                      | 445         | <i>Mortonii</i> .....          | 561  |
| <i>tubulifera</i> .....                      | 444         | <i>Trachelospermum</i> .....   | 18; 19; 266  |
| <i>umbellata</i> .....                       | 242; 448    | <i>asiaticum</i> .....         | 303  |
| <i>Thyrsanthus</i> .....                     | 5; 187; 420 | <i>difforme</i> .....          | 19; 266; 267; 268; 270; 272; 406; 417; 419; 422                          |
| <i>Acouci</i> .....                          | 203         | <i>jasminoides</i> .....       | 267  |
| <i>adenobasis</i> .....                      | 241         | <i>stans</i> .....             | 55; 266; 272   |
| <i>affinis</i> .....                         | 200         | <i>Urechites</i> .....         | 6; 10; 14; 16; 19; 370   |
| <i>Aubletianus</i> .....                     | 242         | <i>Andrewsii</i> .....         | 373  |
| <i>Benthamiana</i> .....                     | 204         | <i>Andrieuxii</i> .....        | 375  |
| <i>bracteatus</i> .....                      | 236         | <i>dolicantha</i> .....        | 373  |
| <i>Brasiliensis</i> .....                    | 224         | <i>Jaegeri</i> .....           | 372  |
| <i>corylifolia</i> .....                     | 245         | <i>Karwinskii</i> .....        | 377; 433   |
| <i>corymbiferus</i> .....                    | 242         | <i>lutea</i> .....             | 16; 371; 372; 376; 382; 383; 399; 401; 403; 406; 409; 410; 414; 415; 421 |
| <i>corymbosus</i> .....                      | 252         | <i>var. angustifolia</i> ..... | 373  |
| <i>crebriflorus</i> .....                    | 226         | <i>Neriandra</i> .....         | 373  |
| <i>difformis</i> .....                       | 263         | <i>pinctorum</i> .....         | 373  |
| <i>diospyrifolius</i> .....                  | 209         | <i>suberecta</i> .....         | 372  |
| <i>embelioides</i> .....                     | 193         | <i>β. glabrata</i> .....       | 372  |
| <i>Gardneri</i> .....                        | 199         | <i>γ. rotundifolia</i> .....   | 372  |
| <i>glabrescens</i> .....                     | 228         | <i>Vinca</i> .....             |  |
| <i>gracilis</i> .....                        | 192         | <i>lutea</i> .....             | 372; 382; 383; 399; 401; 403; 406; 409; 410; 414; 421                    |
| <i>Guyanensis</i> .....                      | 206         | <i>sternutatoria</i> .....     | 384  |
| <i>laurifolius</i> .....                     | 212         | <i>Zschokkea</i> .....         | 303  |
| <i>leptocarpus</i> .....                     | 224         |                                |  |
| <i>Luschnatii</i> .....                      | 195         |                                |  |
| <i>macrophyllus</i> .....                    | 242         |                                |  |
| <i>meridionalis</i> .....                    | 194         |                                |  |
| <i>multinervius</i> .....                    | 234         |                                |  |

N. B. As the final section of "The American Genera of Echitoideae" goes to press the type specimens of Sessé & Mocino's ambiguous species of *Echites* are received from Madrid through the courtesy of Mr. Paul C. Standley, of the Field Museum of Natural History, Chicago. As a result these poorly understood entities may now be assigned definite status in many instances, although too late to be included within the present account. A subsequent paper concerning them will be published in the near future.

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## EXPLANATION OF PLATE

## PLATE 1

*Allomarkgrafia ovalis* (Mgf.) Woods.Habit ( $\times \frac{3}{4}$ ) and dissection of calyx and reproductive organs ( $\times 10$ ).

Fig. 1. Anther, side view.

Fig. 2. Anther, ventral view.

Fig. 3. Dissected calyx, showing internal squamellae; nectaries, ovary, style, and stigma.



WOODSON—STUDIES IN APOCYNACEAE







## EXPLANATION OF PLATE

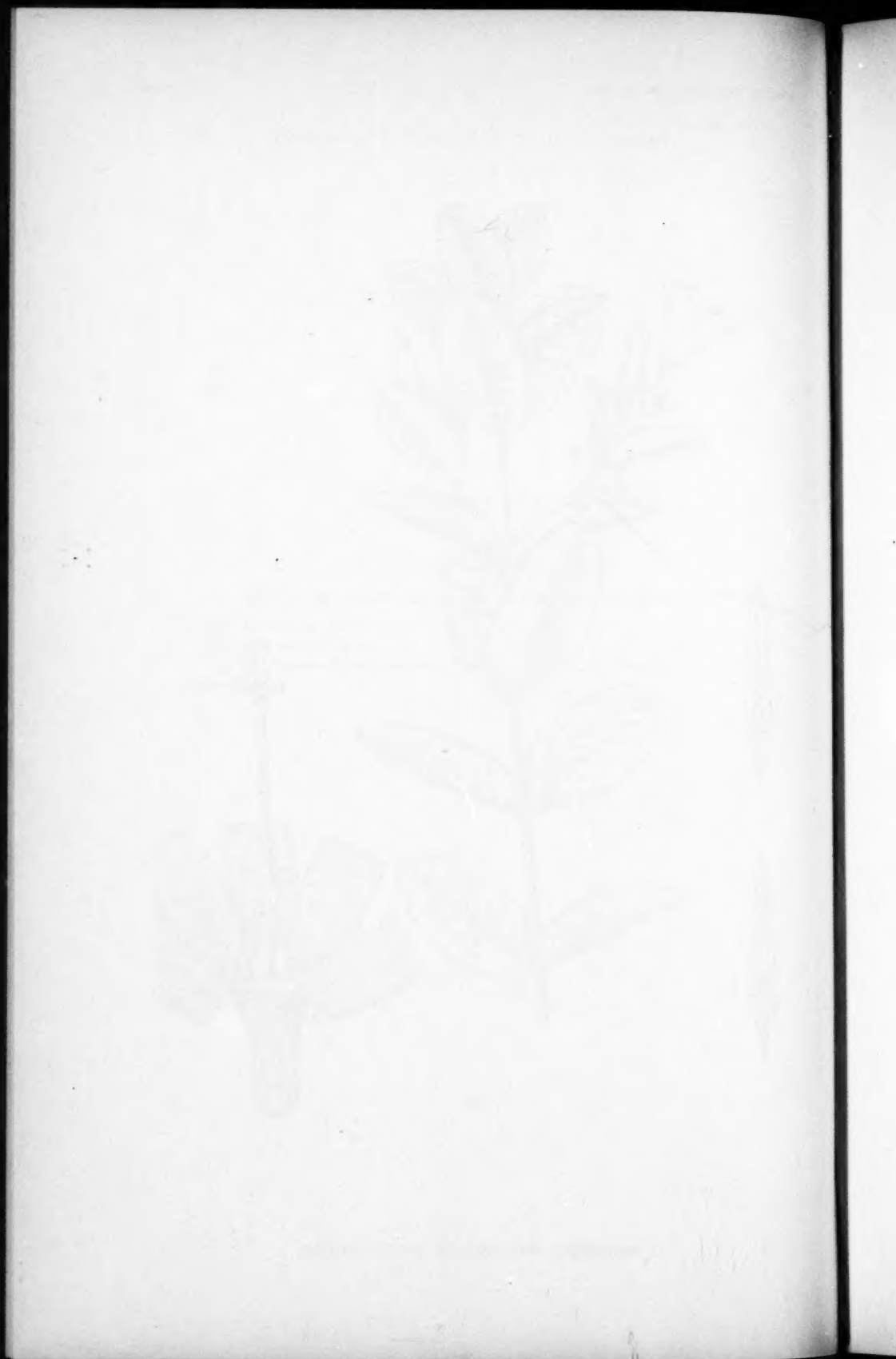
## PLATE 2

*Galactophora calycina* (Hub.) Woods.Habit ( $\times \frac{2}{3}$ ) and dissection of calyx and reproductive organs ( $\times 5$ ).

- Fig. 1. Anther, dorsal view.  
Fig. 2. Anther, ventral view.  
Fig. 3. Dissected calyx, showing internal squamellae; nectaries, ovary, style, and stigma.



WOODSON—STUDIES IN APOCYNACEAE







## EXPLANATION OF PLATE

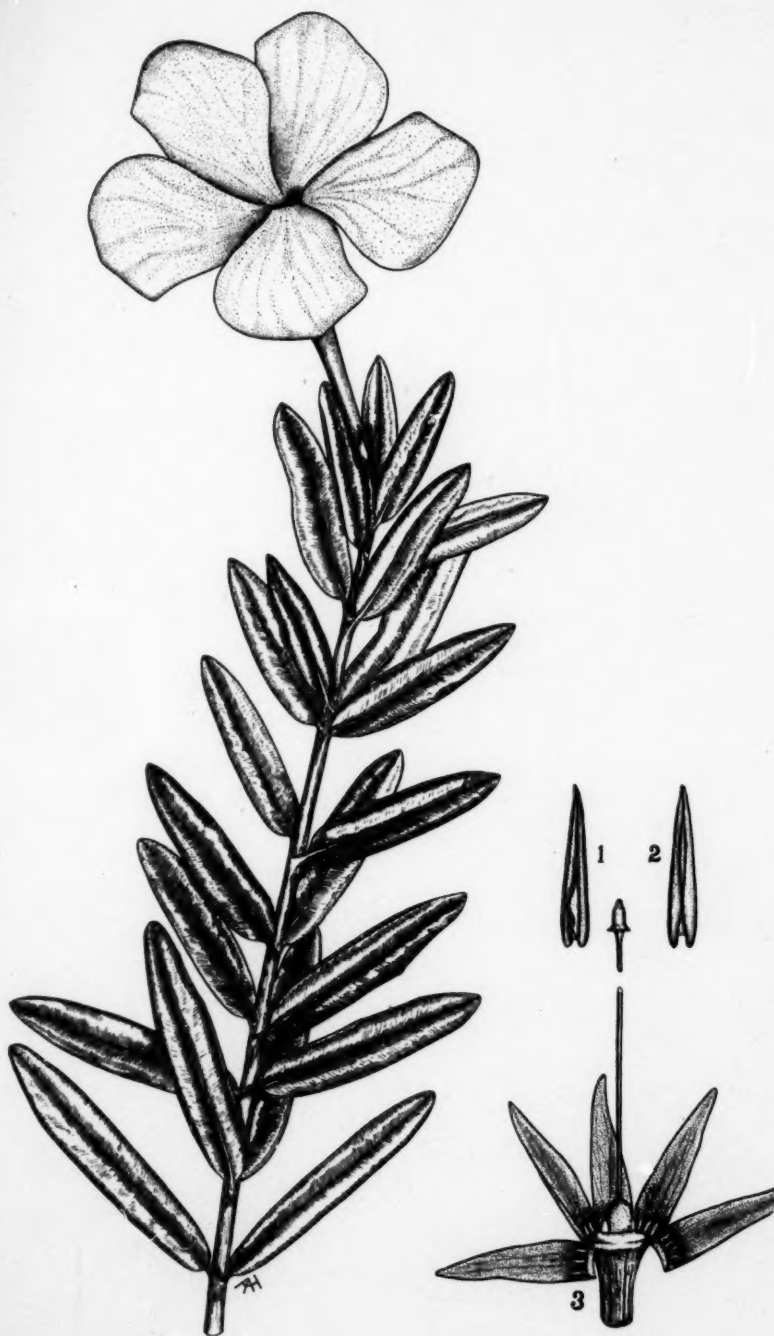
## PLATE 3

*Salpinctes kalmiaefolius* Woods.Habit ( $\times 1$ ) and dissection of calyx and reproductive organs ( $\times 5$ ).

Fig. 1. Anther, ventral view.

Fig. 2. Anther, dorsal view.

Fig. 3. Dissected calyx, showing squamellae; nectaries, ovary, style, and stigma.



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## EXPLANATION OF PLATE

## PLATE 4

*Peltastes malvaeflorus* Woods.Habit ( $\times \frac{1}{2}$ ) and dissection of calyx and reproductive organs ( $\times 4$ ).

- Fig. 1. Seed ( $\times 2$ ).  
Fig. 2. Stigma and portion of style.  
Fig. 3. Anther, ventral view.  
Fig. 4. Dissected calyx, showing squamellae; nectaries and ovary.





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*Passiflora ligularis* L.



## EXPLANATION OF PLATE

## PLATE 5

*Fernaldia pandurata* (A. DC.) Woods.Habit ( $\times \frac{2}{3}$ ) and dissection of calyx and reproductive organs ( $\times 5$ ).

- Fig. 1. Anther, ventral view.
- Fig. 2. Anther, side view.
- Fig. 3. Stigma.
- Fig. 4. Dissection of calyx, showing squamellae; nectaries and ovary.



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## EXPLANATION OF PLATE

## PLATE 6

*Asketanthera calycosa* (A. Rich.) Woods.Habit ( $\times \frac{3}{8}$ ) and dissection of calyx and reproductive organs ( $\times 4$ ).

Fig. 1. Anther, dorsal view.

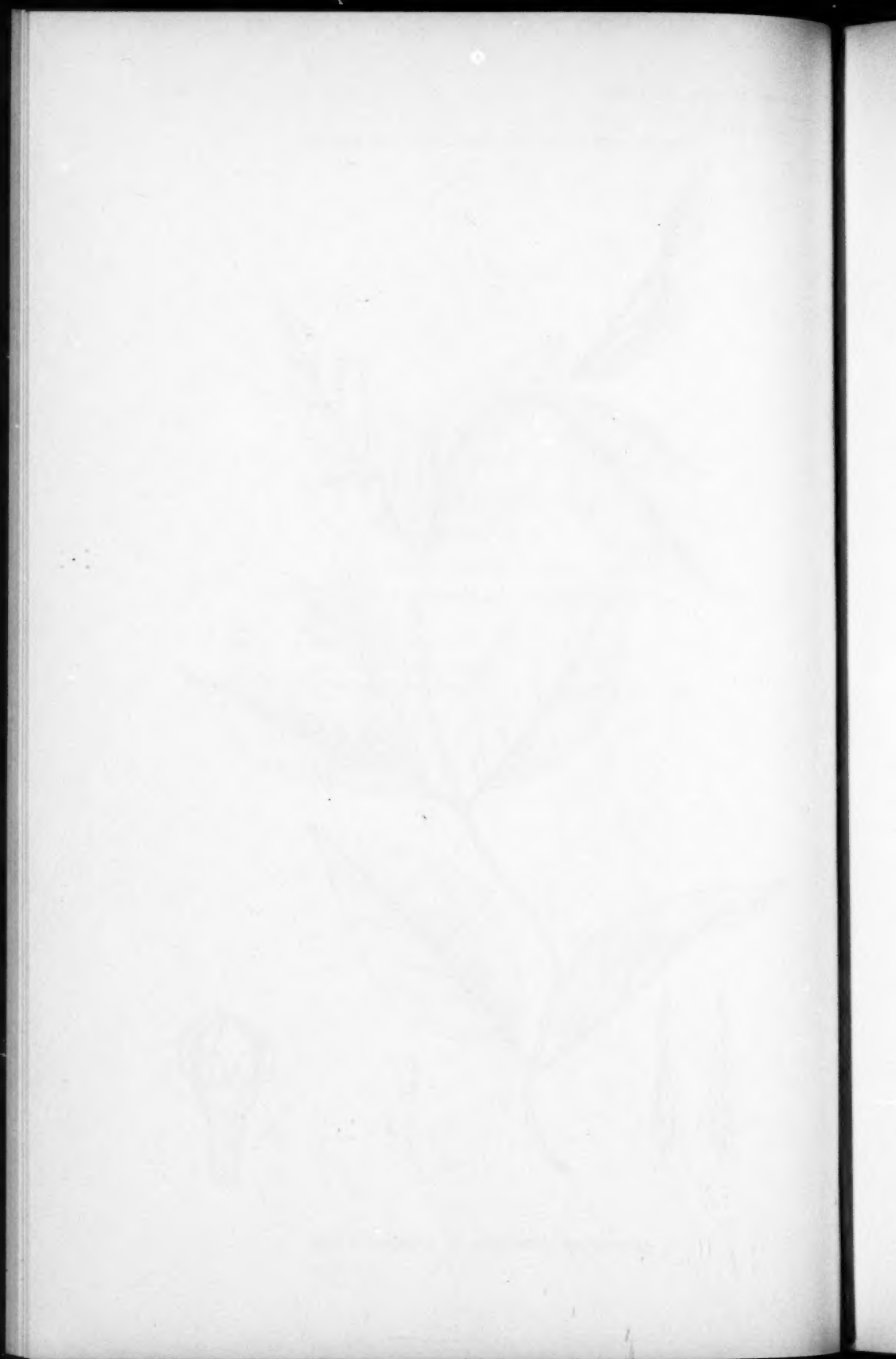
Fig. 2. Anther, ventral view.

Fig. 3. Stigma and portion of style.

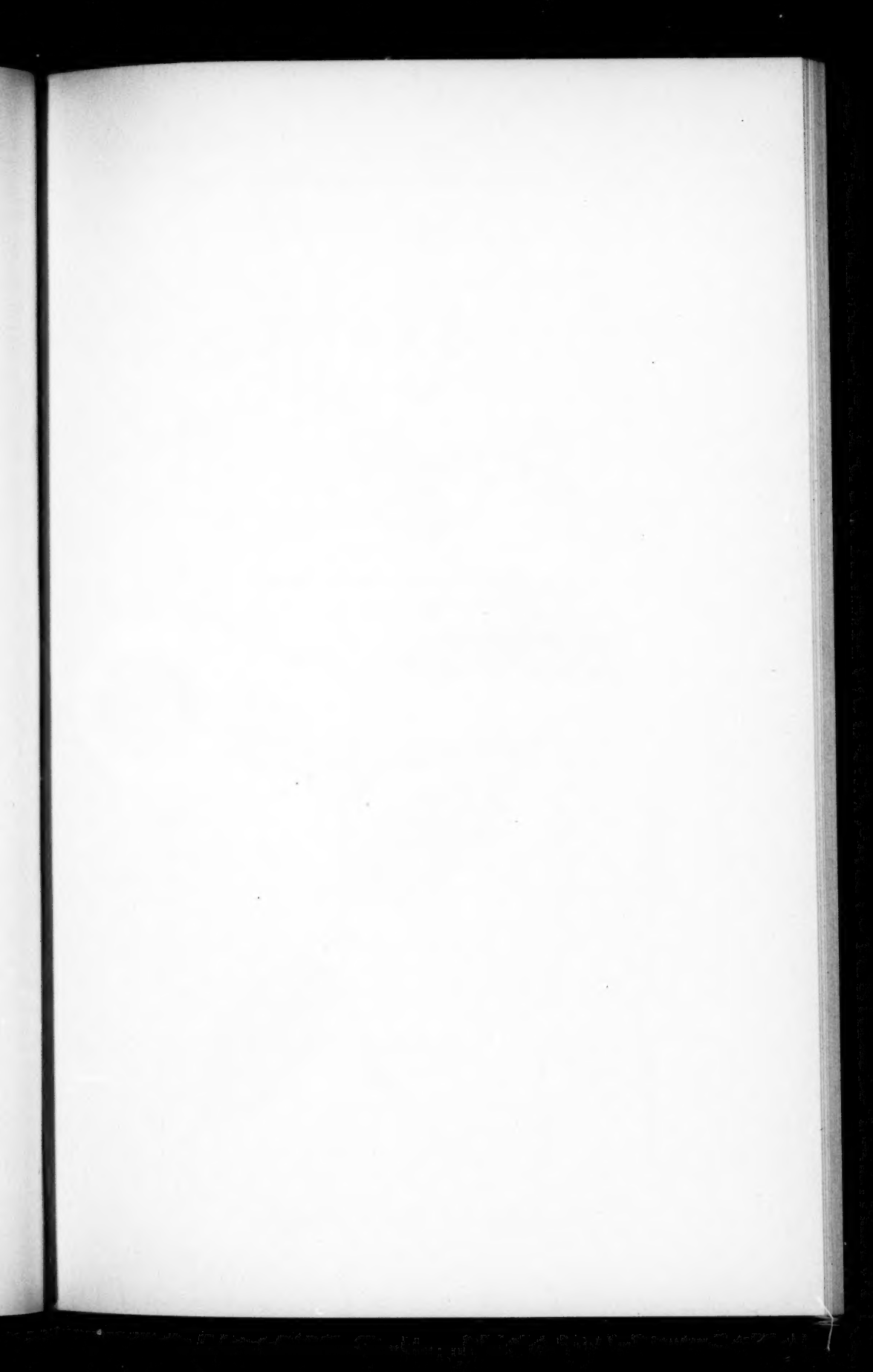
Fig. 4. Dissected calyx, showing squamellae; nectaries and ovary.



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## EXPLANATION OF PLATE

## PLATE 7

*Tintinnabularia Mortonii* Woods.Habit ( $\times \frac{1}{2}$ ) and dissection of reproductive organs ( $\times 2$ ).

- Fig. 1. Stigma and style.  
Fig. 2. Anther, dorsal view.  
Fig. 3. Anther, ventral view.



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